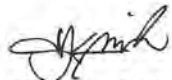




**ICP Test Report Certification Packet**

Company name: Littelfuse, Inc.  
Product Series: 342 Series - Military Spec Drip-Proof Fuseholder for 3AG, F02 and F03 Fuses  
Product #: 03420021Z Series  
Issue Date: August 5, 2010

It is hereby certified by Littelfuse, Inc. that there is neither RoHS (EU Directive 2002/95/EC)-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 03420021Z Series 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 : under RoHS exemption 6c: Lead as an alloying element in copper not exceeding 4% lead by weight.



**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	889-118	Body Insert	3-6
2	875-5xx (875-546-001)	Back Terminal	7-12
3	342021-1/ 057143	Body	13-19
4	342021-2/ 057143	Knob	13-19
5	886-140	Side Terminal	20-24
6	889-117	Knob Insert	25-28
7	882-xxx (882-119)	Contact	29-33
8	912-xxx (912-312)	Spring	34-39
9	692469	Solder	40-45
10	905-xxx (905-010)	Lock washer	46-50



# Test Report

No. : CE/2008/A5029

Date : 2008/10/27

Page : 1 of 4

LITTELFUSE INC.

800 E. NORTHWEST HIGHWAY, DES PLAINES, IL 60016



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

Sample Description : BODY INSERT  
 Style/Item No. : 889-118  
 Sample Receiving Date : 2008/10/22  
 Testing Period : 2008/10/22 TO 2008/10/27

=====  
 Test Requested : In accordance with the RoHS Directive 2002/95/EC, and its amendment directives.

Test Method : With reference to IEC 62321/2nd CDV (111/95/CDV) Procedures for the Determination of Levels of Regulated Substances in Electrotechnical Products.

- (1) Determination of Cadmium by ICP-AES.
- (2) Determination of Lead by ICP-AES.
- (3) Determination of Mercury by ICP-AES.
- (4) Determination of Hexavalent Chromium for metallic samples by Spot test / boiling water extraction Method.

Test Result(s) : Please refer to next page(s).

Nicole Chien / Supervisor

Signed for and on behalf of

SGS TAIWAN LTD.

Chemical Laboratory - Taipei

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# Test Report

No. : CE/2008/A5029 Date : 2008/10/27 Page : 2 of 4

LITTELFUSE INC.  
800 E. NORTHWEST HIGHWAY, DES PLAINES, IL 60016



Test results by chemical method (Unit: mg/kg)

Test Item (s):	Method (Refer to)	Result	MDL
		No.1	
Cadmium (Cd)	(1)	28	2
Lead (Pb)	(2)	26600	2
Mercury (Hg)	(3)	n.d.	2
Hexavalent Chromium Cr(VI) by Spot test / boiling water extraction	(4)	Negative	See Note 4

## TEST PART DESCRIPTION:

NO.1 : SILVER COLORED METAL INSERT

Note : 1. mg/kg = ppm

2. n.d. = Not Detected

3. MDL = Method Detection Limit

4. Spot-test:

Negative = Absence of Cr(VI) coating / surface layer,

Positive = Presence of Cr(VI) coating / surface layer;

(The tested sample should be further verified by boiling-water-extraction method if the spot test result cannot be confirmed.)

Boiling-water-extraction:

Negative = Absence of Cr(VI) coating / surface layer.

Positive = Presence of Cr(VI) coating / surface layer;

the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm<sup>2</sup> sample surface area.

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# Test Report

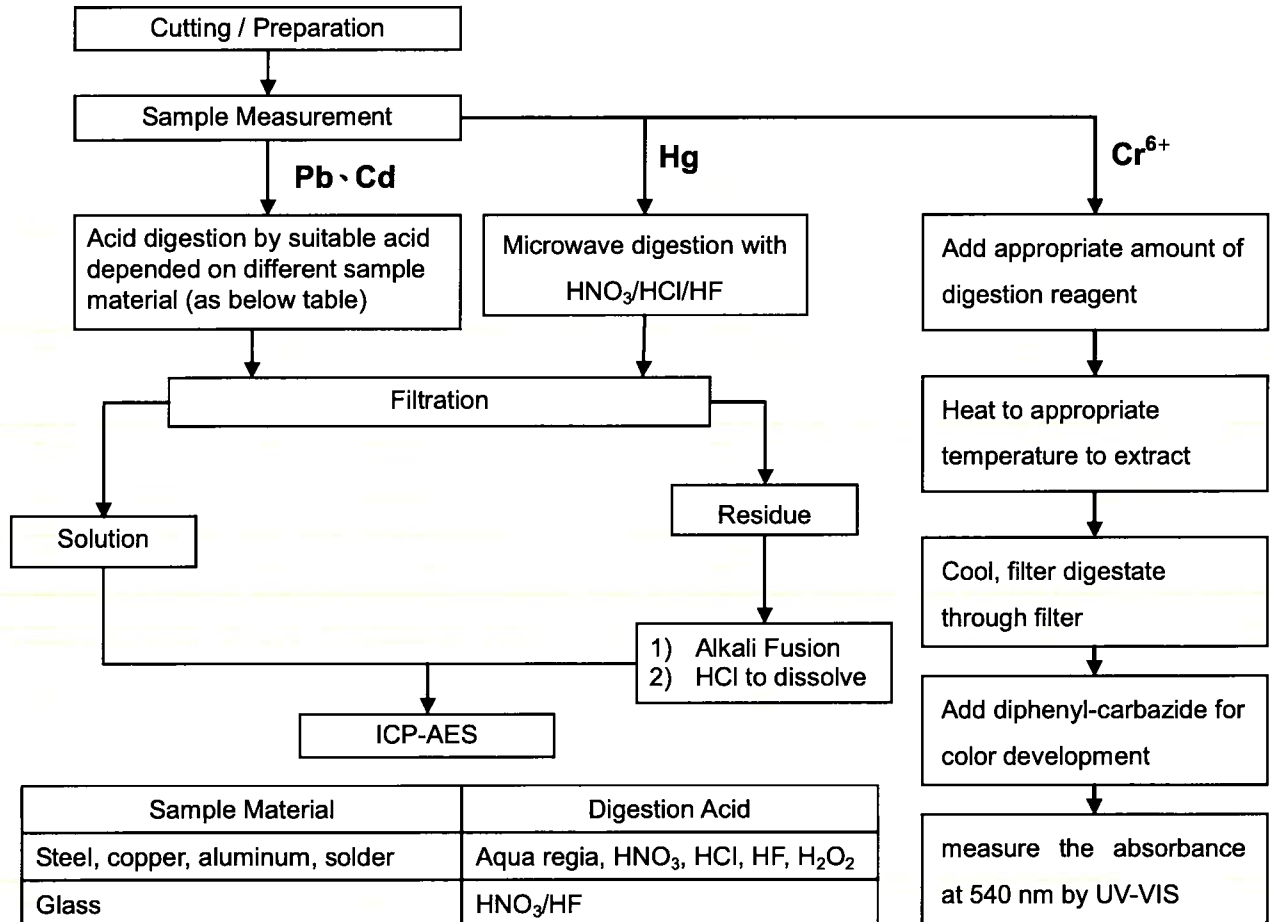
No. : CE/2008/A5029 Date : 2008/10/27

Page : 3 of 4

LITTELFUSE INC.  
800 E. NORTHWEST HIGHWAY, DES PLAINES, IL 60016



- 1) These samples were dissolved totally by pre-conditioning method according to below flow chart.  
(Cr<sup>6+</sup> test method excluded)
- 2) Name of the person who made measurement: Climbgreat Yang
- 3) Name of the person in charge of measurement: Troy Chang



Sample Material	Digestion Acid
Steel, copper, aluminum, solder	Aqua regia, HNO <sub>3</sub> , HCl, HF, H <sub>2</sub> O <sub>2</sub>
Glass	HNO <sub>3</sub> /HF
Gold, platinum, palladium, ceramic	Aqua regia
Silver	HNO <sub>3</sub>
Plastic	H <sub>2</sub> SO <sub>4</sub> , H <sub>2</sub> O <sub>2</sub> , HNO <sub>3</sub> , HCl
Others	Any acid to total digestion

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# Test Report

No. : CE/2008/A5029

Date : 2008/10/27

Page : 4 of 4

LITTELFUSE INC.

800 E. NORTHWEST HIGHWAY, DES PLAINES, IL 60016



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

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Test Report

Number : TWNC00108558  
Page 1 Of 6

Applicant: Littelfuse, Inc.  
800 E. Northwest Hwy  
Desplaines Il 60016

Date : FEB 27, 2009

Sample Description:

One (1) group of submitted samples said to be :  
Part Description : Back Terminal  
Part Number : 875-524  
Date Sample Received : FEB 24, 2009  
Date Test Started : FEB 25, 2009

---

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 :

<u>Testing Item</u>	<u>Result (ppm)</u>
	<u>Silvery Metal</u>
<b>Heavy Metal</b>	
Cadmium (Cd) content	ND
Lead (Pb) content	43
Mercury (Hg) content	ND
Chromium VI (Cr <sup>6+</sup> ) content	ND

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

Responsibility Of Chemist : Irene Chiou / Kevin Liu

Date Sample Received : FEB 24, 2009

Testing Period : FEB 25, 2009 To FEB 26, 2009

## ( II ) RoHS Requirement:

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

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

## 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



## Test Conducted

## ( III ) Test Method:

Testing Item	Testing 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 USEPA 3060A & 7196A, by alkaline digestion and determined by UV-Vis Spectrophotometer	1 ppm

Remark: Reporting limit = Quantitation limit of analyte in sample

---

## 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

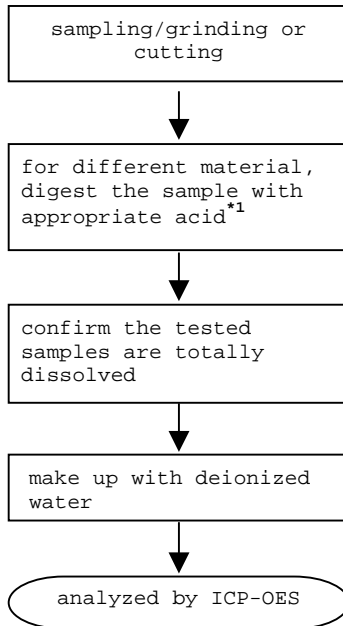
114 台北市內湖區瑞光路 423 號 8 樓

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

Test Conducted

(IV) Measurement Flowchart:

Test For Heavy Metal (Cd/Pb/Hg) Contents  
Reference Standard: IEC 62321 edition 1.0:2008



Remarks:

\*1: List Of Appropriate Acid:

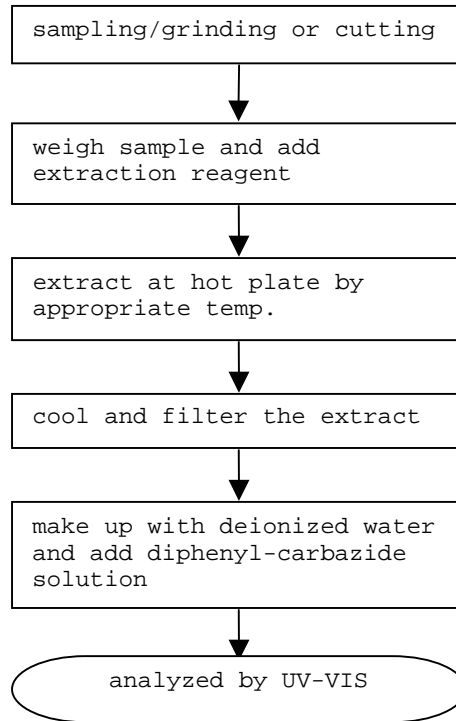
Material	Acid Added For Digestion
Polymers	HNO <sub>3</sub> , HCl, HF, H <sub>2</sub> O <sub>2</sub> , H <sub>3</sub> BO <sub>3</sub>
Metals	HNO <sub>3</sub> , HCl, HF
Electronics	HNO <sub>3</sub> , HCl, H <sub>2</sub> O <sub>2</sub> , HBF <sub>4</sub>

## Test Conducted

## (IV) Measurement Flowchart:

Test For Chromium (VI) Content

Reference Standard: USEPA 3060A/7196A



---

End Of Report

**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

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Test Conducted

Photo





# Test Report

No. : CE/2008/A3464 Date : 2008/10/21 Page : 1 of 7


LITTELFUSE INC.  
800 E. NORTHWEST HIGHWAY, DES PLAINES, IL 60016-3096, USA



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

Sample Description	:	BODY (057143)
Style/Item No.	:	340267-11
Sample Receiving Date	:	2008/10/16
Testing Period	:	2008/10/16 TO 2008/10/21

=====  
Test Result(s) : Please refer to next page(s).

  
**Chenyu Kung / Operation Manager**  
**Signed for and on behalf of**  
**SGS TAIWAN LTD.**  
**Chemical Laboratory – Taipei**

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# Test Report

No. : CE/2008/A3464 Date : 2008/10/21 Page : 2 of 7

LITTELFUSE INC.  
800 E. NORTHWEST HIGHWAY, DES PLAINES, IL 60016-3096, USA



## Test Result(s)

PART NAME NO.1 : GRAY PLASTIC

Test Item (s):	Unit	Method	MDL	Result
				No.1
Cadmium (Cd)	mg/kg	With reference to IEC 62321/2nd CDV (111/95/CDV). Determination of Cadmium by ICP-AES.	2	n.d.
Lead (Pb)	mg/kg	With reference to IEC 62321/2nd CDV (111/95/CDV). Determination of Lead by ICP-AES.	2	11
Mercury (Hg)	mg/kg	With reference to IEC 62321/2nd CDV (111/95/CDV). Determination of Mercury by ICP-AES.	2	n.d.
Hexavalent Chromium Cr(VI) by alkaline extraction	mg/kg	With reference to IEC 62321/2nd CDV (111/95/CDV). Determination of Hexavalent Chromium for non-metallic samples by UV/Vis Spectrometry.	2	n.d.
Halogen	---	With reference to BS EN 14582:2007. Analysis was performed by IC method for F , Cl , Br, I content.	---	---
Halogen-Fluorine (F) (CAS No.: 014762-94-8)	mg/kg	With reference to BS EN 14582:2007. Analysis was performed by IC method for Fluorine content.	50	n.d.
Halogen-Chlorine (Cl) (CAS No.: 022537-15-1)	mg/kg	With reference to BS EN 14582:2007. Analysis was performed by IC method for Chlorine content.	50	32400
Halogen-Bromine (Br) (CAS No.: 010097-32-2)	mg/kg	With reference to BS EN 14582:2007. Analysis was performed by IC method for Bromine content.	50	n.d.
Halogen-Iodine (I) (CAS No.: 014362-44-8)	mg/kg	With reference to BS EN 14582:2007. Analysis was performed by IC method for Iodine content.	50	n.d.

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# Test Report

No. : CE/2008/A3464 Date : 2008/10/21 Page : 3 of 7

LITTELFUSE INC.  
800 E. NORTHWEST HIGHWAY, DES PLAINES, IL 60016-3096, USA



Test Item (s):	Unit	Method	MDL	Result
				No.1
<b>Sum of PBBs</b>	mg/kg	With reference to IEC 62321/2nd CDV (111/95/CDV). Determination of PBB and PBDE by GC/MS.	-	n.d.
Monobromobiphenyl			5	n.d.
Dibromobiphenyl			5	n.d.
Tribromobiphenyl			5	n.d.
Tetrabromobiphenyl			5	n.d.
Pentabromobiphenyl			5	n.d.
Hexabromobiphenyl			5	n.d.
Heptabromobiphenyl			5	n.d.
Octabromobiphenyl			5	n.d.
Nonabromobiphenyl			5	n.d.
Decabromobiphenyl			5	n.d.
<b>Sum of PBDEs</b>			-	n.d.
Monobromodiphenyl ether			5	n.d.
Dibromodiphenyl ether			5	n.d.
Tribromodiphenyl ether			5	n.d.
Tetrabromodiphenyl ether			5	n.d.
Pentabromodiphenyl ether			5	n.d.
Hexabromodiphenyl ether			5	n.d.
Heptabromodiphenyl ether			5	n.d.
Octabromodiphenyl ether			5	n.d.
Nonabromodiphenyl ether			5	n.d.
Decabromodiphenyl ether			5	n.d.

- Note :
1. mg/kg = ppm
  2. n.d. = Not Detected
  3. MDL = Method Detection Limit
  4. " - " = Not Regulated
  5. "---" = Not Conducted

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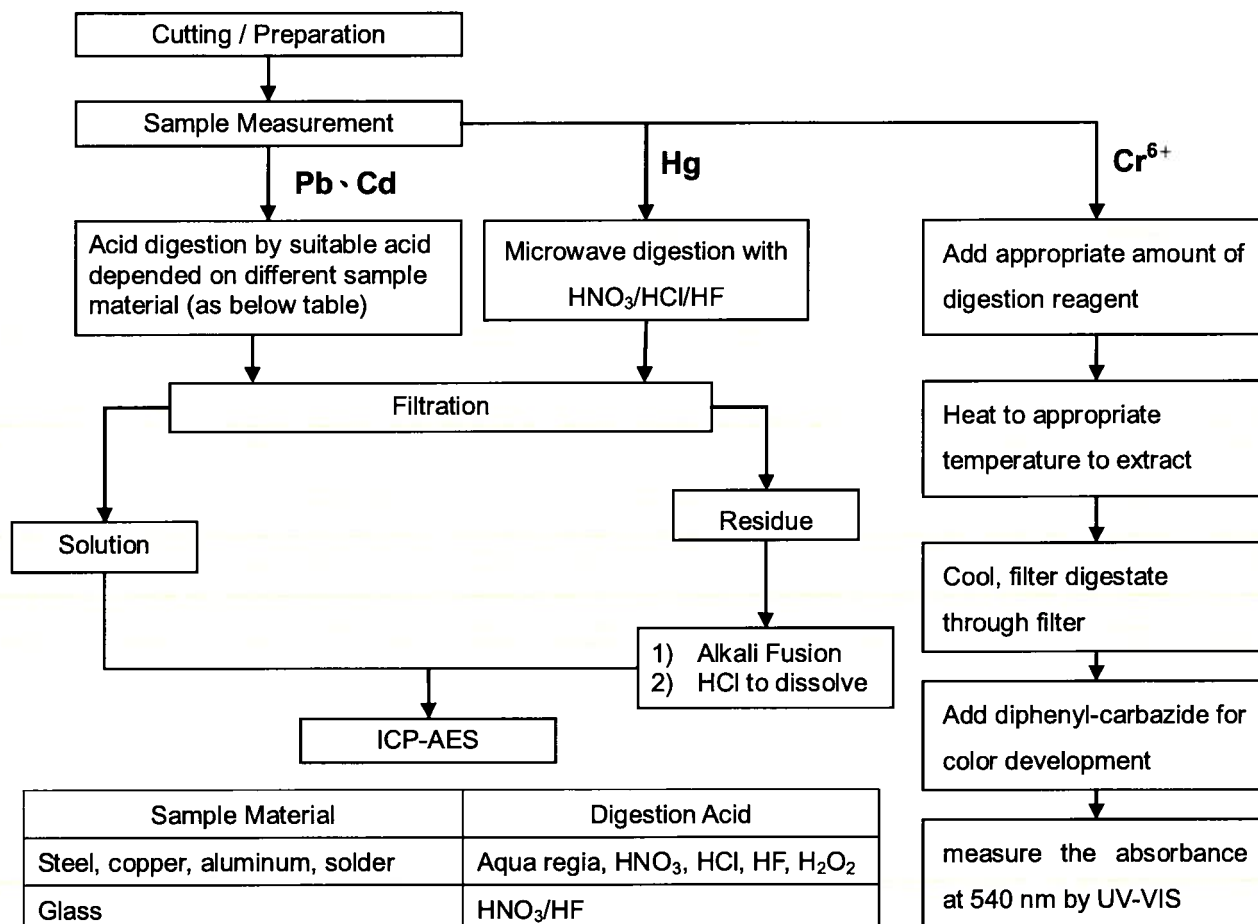
# Test Report

No. : CE/2008/A3464 Date : 2008/10/21 Page : 4 of 7

LITTELFUSE INC.  
800 E. NORTHWEST HIGHWAY, DES PLAINES, IL 60016-3096, USA



- 1) These samples were dissolved totally by pre-conditioning method according to below flow chart.  
(Cr<sup>6+</sup> test method excluded)
- 2) Name of the person who made measurement: Climbgreat Yang
- 3) Name of the person in charge of measurement: Troy Chang



Sample Material	Digestion Acid
Steel, copper, aluminum, solder	Aqua regia, HNO <sub>3</sub> , HCl, HF, H <sub>2</sub> O <sub>2</sub>
Glass	HNO <sub>3</sub> /HF
Gold, platinum, palladium, ceramic	Aqua regia
Silver	HNO <sub>3</sub>
Plastic	H <sub>2</sub> SO <sub>4</sub> , H <sub>2</sub> O <sub>2</sub> , HNO <sub>3</sub> , HCl
Others	Any acid to total digestion

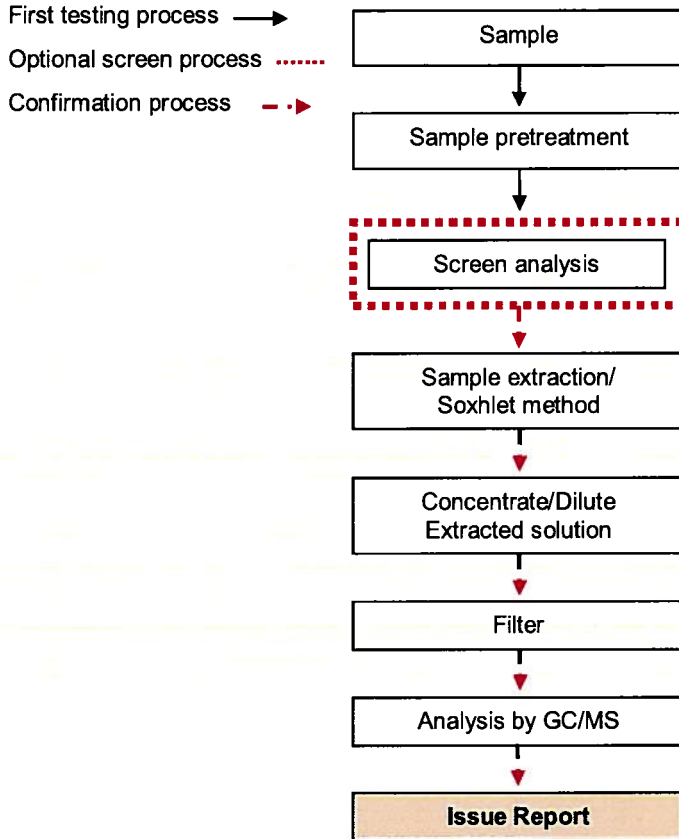
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## PBB/PBDE analytical FLOW CHART

- 1) Name of the person who made measurement: Roman Wong
- 2) Name of the person in charge of measurement: Shinjyh Chen



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# Test Report

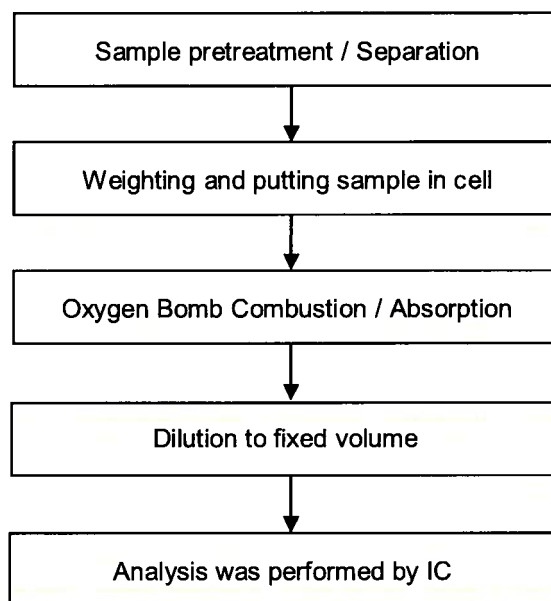
No. : CE/2008/A3464 Date : 2008/10/21 Page : 6 of 7

LITTELFUSE INC.  
800 E. NORTHWEST HIGHWAY, DES PLAINES, IL 60016-3096, USA



## Analytical flow chart of halogen content

- 1) Name of the person who made measurement: Alan Chen
- 2) Name of the person in charge of measurement: Troy Chang



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# Test Report

No. : CE/2008/A3464    Date : 2008/10/21    Page : 7 of 7

LITTELFUSE INC.  
800 E. NORTHWEST HIGHWAY, DES PLAINES, IL 60016-3096, USA



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

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# Test Report

No. : CE/2008/A5028 Date : 2008/10/27

Page : 1 of 5

LITTELFUSE INC.  
800 E. NORTHWEST HIGHWAY, DES PLAINES, IL 60016



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

Sample Description	:	SIDE TERMINAL
Style/Item No.	:	886-140
Sample Receiving Date	:	2008/10/22
Testing Period	:	2008/10/22 TO 2008/10/27

=====

**Test Requested** : In accordance with the RoHS Directive 2002/95/EC, and its amendment directives.

**Test Method** : With reference to IEC 62321/2nd CDV (111/95/CDV) Procedures for the Determination of Levels of Regulated Substances in Electrotechnical Products.

- (1) Determination of Cadmium by ICP-AES.
- (2) Determination of Lead by ICP-AES.
- (3) Determination of Mercury by ICP-AES.
- (4) Determination of Hexavalent Chromium for metallic samples by Spot test / boiling water extraction Method.

**Test Result(s)** : Please refer to next page(s).

**Nicole Chien / Supervisor**  
**Signed for and on behalf of**  
**SGS TAIWAN LTD.**  
**Chemical Laboratory - Taipei**

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# Test Report

No. : CE/2008/A5028

Date : 2008/10/27

Page : 2 of 5

LITTELFUSE INC.

800 E. NORTHWEST HIGHWAY, DES PLAINES, IL 60016



Test results by chemical method (Unit: mg/kg)

Test Item (s):	Method (Refer to)	Result		MDL
		No.1	No.2	
Cadmium (Cd)	(1)	n.d.	n.d.	2
Lead (Pb)	(2)	185	18	2
Mercury (Hg)	(3)	n.d.	n.d.	2
Hexavalent Chromium Cr(VI) by Spot test / boiling water extraction	(4)	Negative	Negative	See Note 4

## TEST PART DESCRIPTION:

NO.1 : PLATING LAYER OF SILVER COLORED METAL  
 NO.2 : BASE MATERIAL OF SILVER COLORED METAL

Note : 1. mg/kg = ppm

2. n.d. = Not Detected

3. MDL = Method Detection Limit

4. Spot-test:

Negative = Absence of Cr(VI) coating / surface layer,

Positive = Presence of Cr(VI) coating / surface layer;

(The tested sample should be further verified by boiling-water-extraction method if the spot test result cannot be confirmed.)

Boiling-water-extraction:

Negative = Absence of Cr(VI) coating / surface layer.

Positive = Presence of Cr(VI) coating / surface layer;

the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm<sup>2</sup> sample surface area.

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SGS Taiwan Ltd.

台灣檢驗科技股份有限公司 | Chemical-Taipei 33 WuChyuan Road, Wuku Industrial Zone, Taipei County, Taiwan / 台北縣五股工業區五權路33號 t + 886 (02)2299 3279 f + 886 (02)2299 3237 www.sgs.com

# Test Report

No. : CE/2008/A5028 Date : 2008/10/27

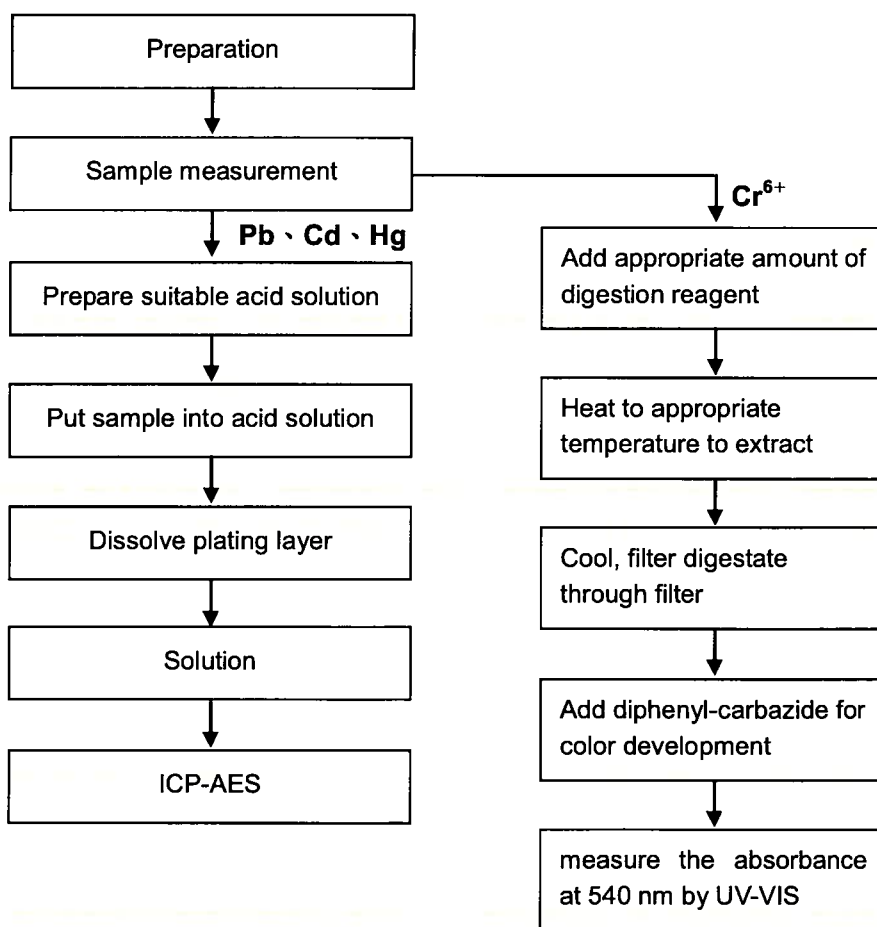
Page : 3 of 5

LITTELFUSE INC.  
800 E. NORTHWEST HIGHWAY, DES PLAINES, IL 60016



- NO.1
- 1) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr<sup>6+</sup> test method excluded)
  - 2) Name of the person who made measurement: Climbgreat Yang
  - 3) Name of the person in charge of measurement: Troy Chang

## Flow Chart of Stripping method for metal analysis



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# Test Report

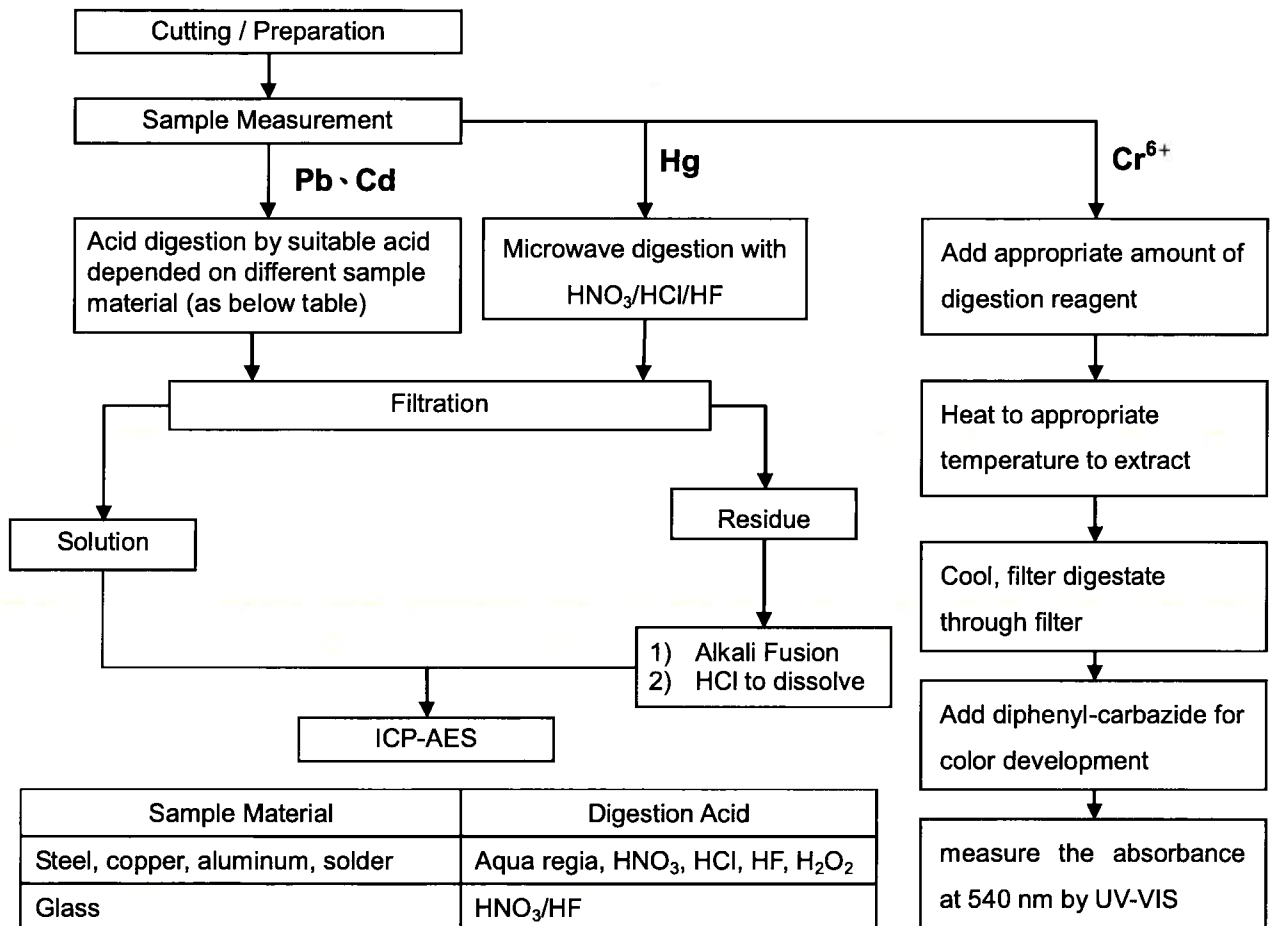
No. : CE/2008/A5028 Date : 2008/10/27

Page : 4 of 5

LITTELFUSE INC.  
800 E. NORTHWEST HIGHWAY, DES PLAINES, IL 60016



- NO.2
- 1) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr<sup>6+</sup> test method excluded)
  - 2) Name of the person who made measurement: Climbgreat Yang
  - 3) Name of the person in charge of measurement: Troy Chang



Sample Material	Digestion Acid
Steel, copper, aluminum, solder	Aqua regia, HNO <sub>3</sub> , HCl, HF, H <sub>2</sub> O <sub>2</sub>
Glass	HNO <sub>3</sub> /HF
Gold, platinum, palladium, ceramic	Aqua regia
Silver	HNO <sub>3</sub>
Plastic	H <sub>2</sub> SO <sub>4</sub> , H <sub>2</sub> O <sub>2</sub> , HNO <sub>3</sub> , HCl
Others	Any acid to total digestion

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# Test Report

No. : CE/2008/A5028

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LITTELFUSE INC.

800 E. NORTHWEST HIGHWAY, DES PLAINES, IL 60016



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

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# Test Report

No. : CE/2008/A5020

Date : 2008/10/27

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LITTELFUSE INC.

800 E. NORTHWEST HIGHWAY, DES PLAINES, IL 60016



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

Sample Description : KNOB INSERT  
 Style/Item No. : 889-117  
 Sample Receiving Date : 2008/10/22  
 Testing Period : 2008/10/22 TO 2008/10/27

=====  
**Test Requested** : In accordance with the RoHS Directive 2002/95/EC, and its amendment directives.

**Test Method** : With reference to IEC 62321/2nd CDV (111/95/CDV) Procedures for the Determination of Levels of Regulated Substances in Electrotechnical Products.

- (1) Determination of Cadmium by ICP-AES.
- (2) Determination of Lead by ICP-AES.
- (3) Determination of Mercury by ICP-AES.
- (4) Determination of Hexavalent Chromium for metallic samples by Spot test / boiling water extraction Method.

**Test Result(s)** : Please refer to next page(s).

**Nicole Chien / Supervisor**  
**Signed for and on behalf of**  
**SGS TAIWAN LTD.**  
**Chemical Laboratory - Taipei**

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# Test Report

No. : CE/2008/A5020

Date : 2008/10/27

Page : 2 of 4

LITTELFUSE INC.

800 E. NORTHWEST HIGHWAY, DES PLAINES, IL 60016



Test results by chemical method (Unit: mg/kg)

Test Item (s):	Method (Refer to)	Result	MDL
		No.1	
Cadmium (Cd)	(1)	27	2
Lead (Pb)	(2)	27400	2
Mercury (Hg)	(3)	n.d.	2
Hexavalent Chromium Cr(VI) by Spot test / boiling water extraction	(4)	Negative	See Note 4

## TEST PART DESCRIPTION:

NO.1 : SILVER COLORED METAL INSERT

Note : 1. mg/kg = ppm

2. n.d. = Not Detected

3. MDL = Method Detection Limit

4. Spot-test:

Negative = Absence of Cr(VI) coating / surface layer,

Positive = Presence of Cr(VI) coating / surface layer;

(The tested sample should be further verified by boiling-water-extraction method if the spot test result cannot be confirmed.)

Boiling-water-extraction:

Negative = Absence of Cr(VI) coating / surface layer.

Positive = Presence of Cr(VI) coating / surface layer;

the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm<sup>2</sup> sample surface area.

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# Test Report

No. : CE/2008/A5020

Date : 2008/10/27

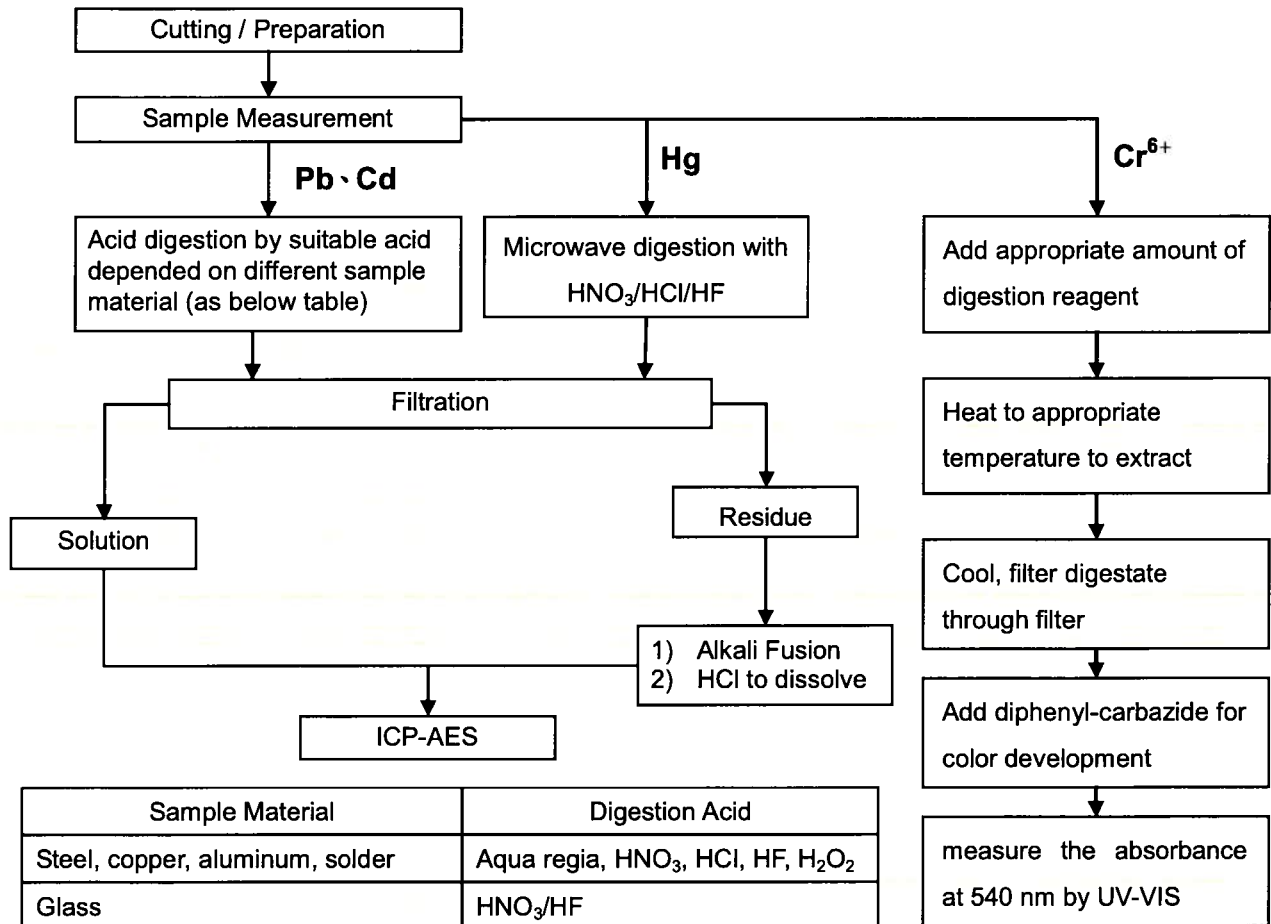
Page : 3 of 4

LITTELFUSE INC.

800 E. NORTHWEST HIGHWAY, DES PLAINES, IL 60016



- 1) These samples were dissolved totally by pre-conditioning method according to below flow chart.  
(Cr<sup>6+</sup> test method excluded)
- 2) Name of the person who made measurement: Climbgreat Yang
- 3) Name of the person in charge of measurement: Troy Chang



Sample Material	Digestion Acid
Steel, copper, aluminum, solder	Aqua regia, HNO <sub>3</sub> , HCl, HF, H <sub>2</sub> O <sub>2</sub>
Glass	HNO <sub>3</sub> /HF
Gold, platinum, palladium, ceramic	Aqua regia
Silver	HNO <sub>3</sub>
Plastic	H <sub>2</sub> SO <sub>4</sub> , H <sub>2</sub> O <sub>2</sub> , HNO <sub>3</sub> , HCl
Others	Any acid to total digestion

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# Test Report

No. : CE/2008/A5020

Date : 2008/10/27

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LITTELFUSE INC.

800 E. NORTHWEST HIGHWAY, DES PLAINES, IL 60016



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## Test Report

No. : CE/2008/15965 Date : 2008/01/24 Page : 1 of 5

LITTELFUSE INC.  
800 E. NORTHWEST HWY. DES PLAINES, IL 60016




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

Sample Description : CONTACT CLIP  
Style/Item No. : 882-756-000  
Facility : PIEDRAS  
Sample Receiving Date : 2008/01/21  
Testing Period : 2008/01/21 TO 2008/01/24

=====  
**Test Requested** : In accordance with the RoHS Directive 2002/95/EC, and its amendment directives.

**Test Method** : With reference to IEC 62321, Ed.1 111/54/CDV Procedures for the Determination of Levels of Regulated Substances in Electrotechnical Products.  
(1) Determination of Cadmium by ICP-AES.  
(2) Determination of Lead by ICP-AES.  
(3) Determination of Mercury by ICP-AES.  
(4) Determination of Hexavalent Chromium for metallic samples by Spot test / Colorimetric Method.

**Test Result(s)** : Please refer to next page(s).

  
Nicole Chien / Supervisor  
Signed for and on behalf of  
SGS TAIWAN LTD.  
Chemical Laboratory - Taipei

# Test Report

No. : CE/2008/15965

Date : 2008/01/24

Page : 2 of 5

LITTELFUSE INC.  
800 E. NORTHWEST HWY. DES PLAINES, IL 60016



Test results by chemical method (Unit: mg/kg)

Test Item (s):	Method (Refer to)	Result		MDL
		No.1	No.2	
Cadmium (Cd)	(1)	n.d.	n.d.	2
Lead (Pb)	(2)	339	7	2
Mercury (Hg)	(3)	n.d.	n.d.	2
Hexavalent Chromium Cr(VI) by Spot test / boiling water extraction	(4)	Negative	Negative	See Note 4

### TEST PART DESCRIPTION:

NO.1 : PLATING LAYER OF SILVER COLORED METAL  
NO.2 : BASE MATERIAL OF SILVER COLORED METAL

Note : 1. mg/kg = ppm

2. n.d. = Not Detected

3. MDL = Method Detection Limit

4. Spot-test:

Negative = Absence of Cr(VI) coating / surface layer,

Positive = Presence of Cr(VI) coating / surface layer;

(The tested sample should be further verified by boiling-water-extraction method if the spot test result cannot be confirmed.)

Boiling-water-extraction:

Negative = Absence of Cr(VI) coating / surface layer.

Positive = Presence of Cr(VI) coating / surface layer;

the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm<sup>2</sup> sample surface area.

# Test Report

No.: CE/2008/15965

Date : 2008/01/24

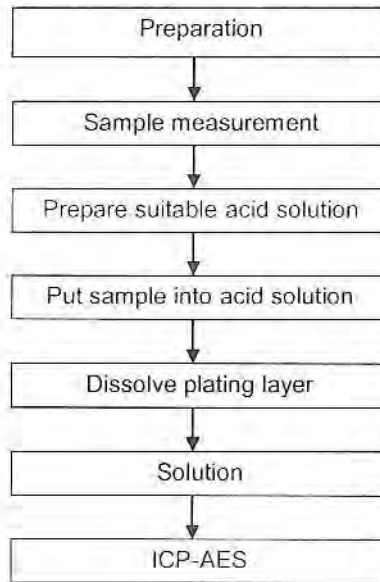
Page : 3 of 5

LITTELFUSE INC.  
800 E. NORTHWEST HWY. DES PLAINES, IL 60016



- NO.1
- 1) These samples were dissolved totally by pre-conditioning method according to below flow chart.
  - 2) Name of the person who made measurement: Troy Chang
  - 3) Name of the person in charge of measurement: Chenyu Kung

### Flow Chart of Stripping method for metal analysis



## Test Report

No. : CE/2008/15965 Date : 2008/01/24

Page : 4 of 5

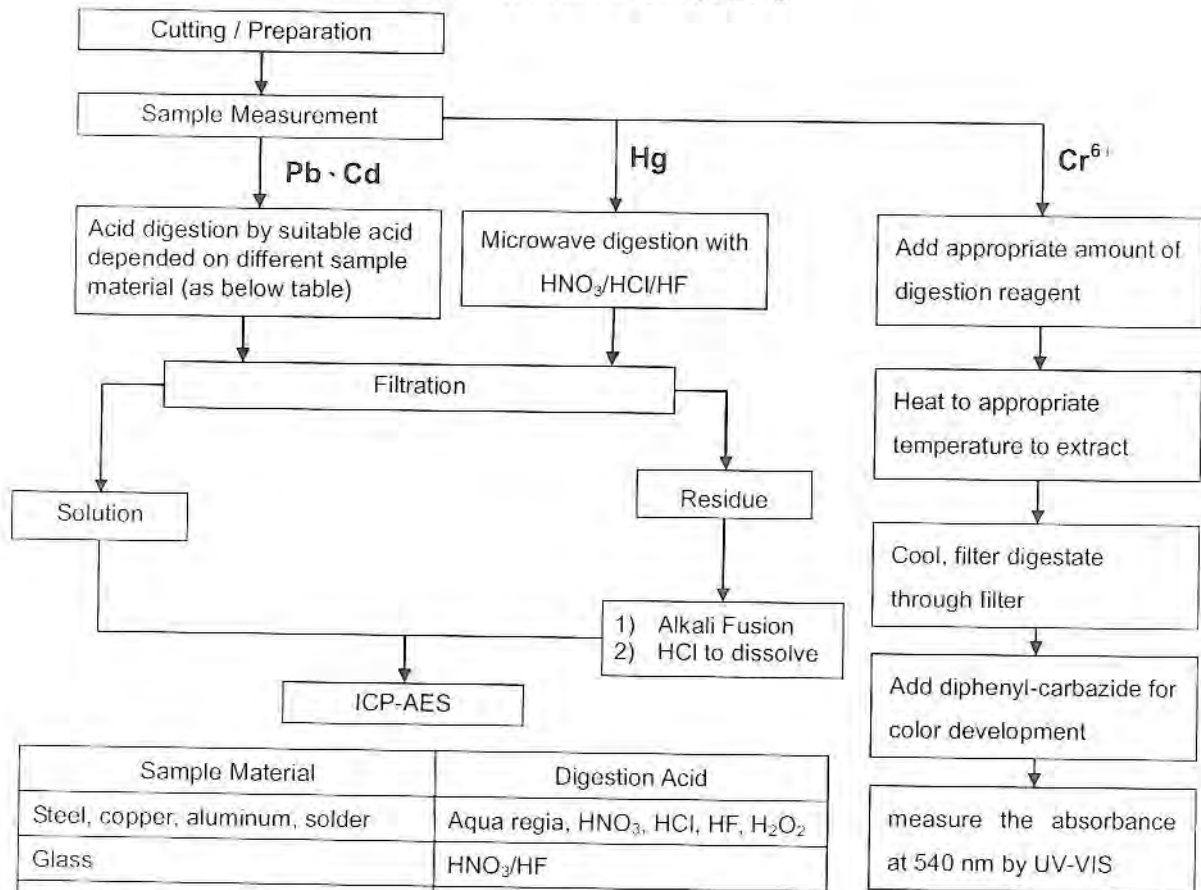
LITTELFUSE INC.  
800 E. NORTHWEST HWY. DES PLAINES, IL 60016



NO.2 1) These samples were dissolved totally by pre-conditioning method according to below flow chart.  
( Cr<sup>6+</sup> test method excluded )

2) Name of the person who made measurement: Troy Chang

3) Name of the person in charge of measurement: Chenyu Kung



Sample Material	Digestion Acid
Steel, copper, aluminum, solder	Aqua regia, HNO <sub>3</sub> , HCl, HF, H <sub>2</sub> O <sub>2</sub>
Glass	HNO <sub>3</sub> /HF
Gold, platinum, palladium, ceramic	Aqua regia
Silver	HNO <sub>3</sub>
Plastic	H <sub>2</sub> SO <sub>4</sub> , H <sub>2</sub> O <sub>2</sub> , HNO <sub>3</sub> , HCl
Others	Any acid to total digestion



## Test Report

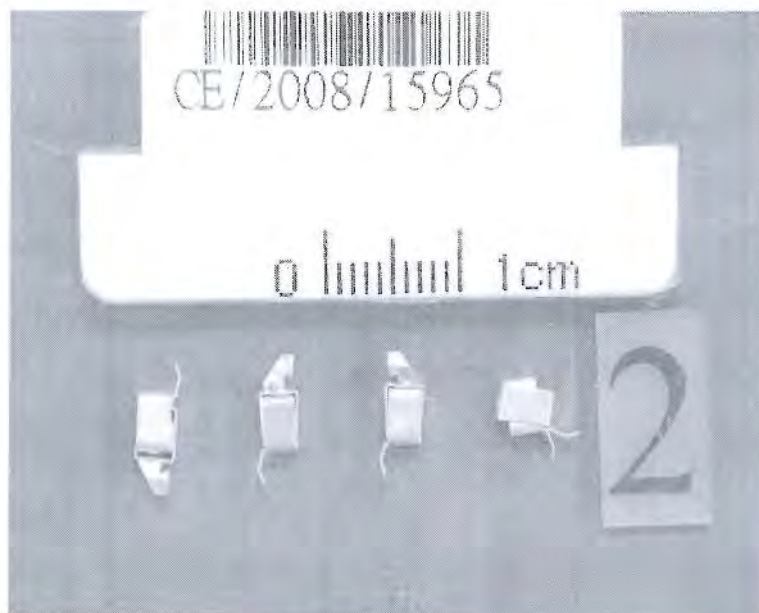
No. : CE/2008/15965

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LITTELFUSE INC.

800 E. NORTHWEST HWY. DES PLAINES, IL 60016



\*\* End of Report \*\*

Test Report

Number : TWNC00107643  
Page 1 Of 6

Applicant: Littelfuse, Inc.  
800 E. Northwest Hwy  
Desplaines Il 60016

Date : Feb 20, 2009

Sample Description:

One (1) group of submitted samples said to be :  
Part Description : Spring  
Part Number : 912-321  
Date Sample Received : Feb 17, 2009  
Date Test Started : Feb 18, 2009

---

Test Conducted :

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

---

Authorized By:  
On Behalf Of Intertek Testing Services  
Taiwan Limited



---

K. Y. Liang  
Director

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approval of the laboratory.

## Test Conducted

## ( I ) Test Result Summary :

<u>Testing Item</u>	<u>Result (ppm)</u>
	<u>Silvery Metal</u>
<b>Heavy Metal</b>	
Cadmium (Cd) content	ND
Lead (Pb) content	ND
Mercury (Hg) content	ND
Chromium VI (Cr <sup>6+</sup> ) content	ND

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

Responsibility Of Chemist : Irene Chiou / Kevin Liu

Date Sample Received : Feb 17, 2009

Testing Period : Feb 18, 2009 to Feb 20, 2009

## ( II ) RoHS Requirement:

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

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

**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

Test Conducted

(III) Test Method:

Testing Item	Testing 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 USEPA 3060A & 7196A, by alkaline digestion and determined by UV-Vis Spectrophotometer	1 ppm

Remark: Reporting limit = Quantitation limit of analyte in sample

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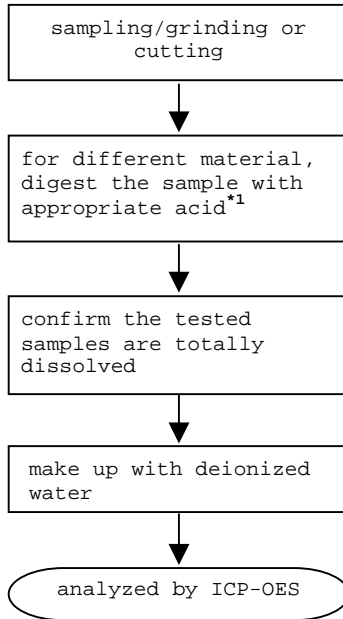
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Test Conducted

(IV) Measurement Flowchart:

Test For Heavy Metal (Cd/Pb/Hg) Contents  
Reference Standard: IEC 62321 edition 1.0:2008



Remarks:

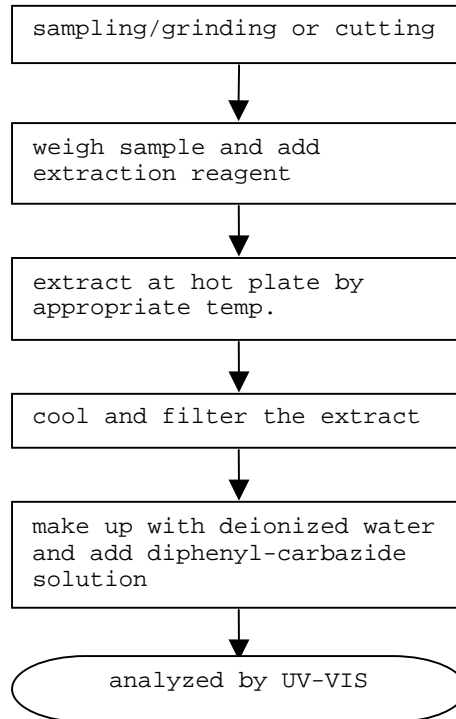
\*1: List Of Appropriate Acid:

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

Test Conducted

(IV) Measurement Flowchart:

Test For Chromium (VI) Content  
Reference Standard: USEPA 3060A/7196A



---

End Of Report

Test Conducted

Photo



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Test Report

Number : TWNC00107711  
Page 1 Of 6

Applicant: Littelfuse, Inc.  
800 E. Northwest Hwy  
Desplaines Il 60016

Date : FEB 20, 2009

Sample Description:

One (1) group of submitted samples said to be :  
Part Description : BAR SOLDER 13.5 X .750  
Part Number : 692469  
Date Sample Received : FEB 18, 2009  
Date Test Started : FEB 18, 2009

---

Test Conducted :

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

---

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 :

<u>Testing Item</u>	<u>Result (ppm)</u>
	<u>Silvery Metal</u>
<b>Heavy Metal</b>	
Cadmium (Cd) content	ND
Lead (Pb) content	401
Mercury (Hg) content	ND
Chromium VI (Cr <sup>6+</sup> ) content	ND

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

Responsibility Of Chemist : Irene Chiou / Kevin Liu

Date Sample Received : FEB 18, 2009

Testing Period : FEB 18, 2009 TO FEB 20, 2009

( II ) RoHS Requirement:

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

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

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## Test Conducted

## (III) Test Method:

Testing Item	Testing 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 USEPA 3060A & 7196A, by alkaline digestion and determined by UV-Vis Spectrophotometer	1 ppm

Remark: Reporting limit = Quantitation limit of analyte in sample

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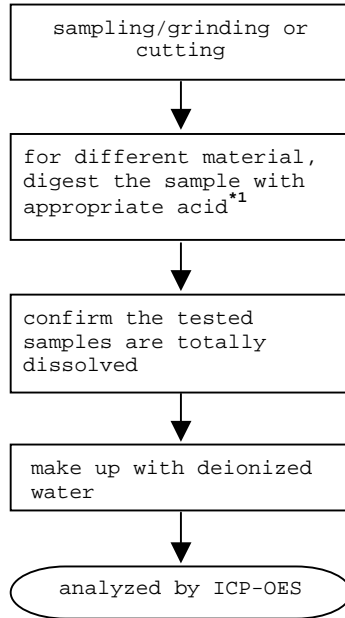
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Test Conducted  
(IV) Measurement Flowchart:

Test For Heavy Metal (Cd/Pb/Hg) Contents  
Reference Standard: IEC 62321 edition 1.0:2008



Remarks:

\*1: List Of Appropriate Acid:

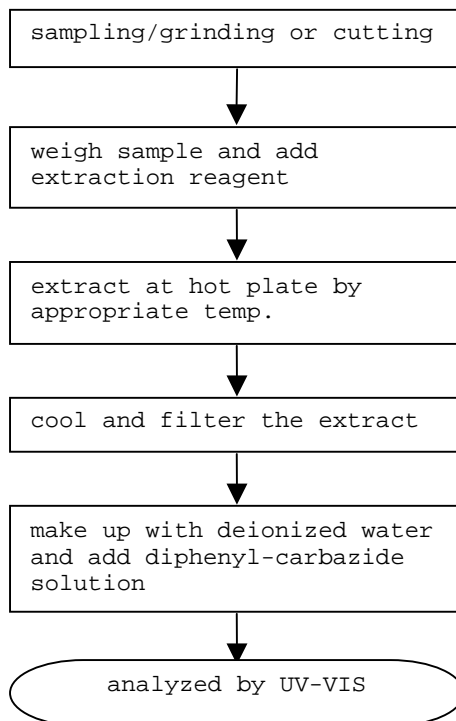
<u>Material</u>	<u>Acid Added For Digestion</u>
Polymers	HNO <sub>3</sub> , HCl, HF, H <sub>2</sub> O <sub>2</sub> , H <sub>3</sub> BO <sub>3</sub>
Metals	HNO <sub>3</sub> , HCl, HF
Electronics	HNO <sub>3</sub> , HCl, H <sub>2</sub> O <sub>2</sub> , HBF <sub>4</sub>

## Test Conducted

## (IV) Measurement Flowchart:

Test For Chromium (VI) Content

Reference Standard: USEPA 3060A/7196A



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End Of Report

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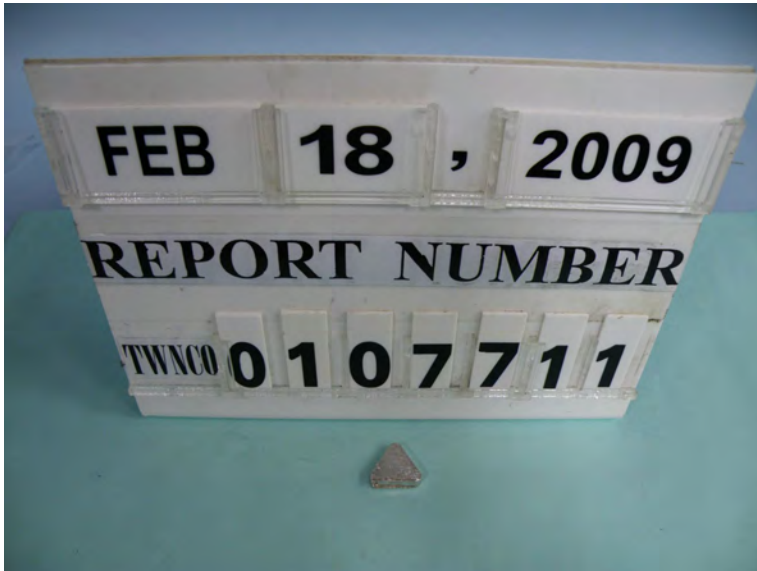
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Test Conducted

Photo



# Test Report

No. : CE/2008/A3638

Date : 2008/10/21

Page : 1 of 5

LITTELFUSE INC.  
800 E. NORTHWEST HIGHWAY, DES PLAINES, IL 60016



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


Sample Description : LOCKWASHER  
Style/Item No. : 905-016  
Sample Receiving Date : 2008/10/16  
Testing Period : 2008/10/16 TO 2008/10/21

=====  
**Test Requested** : In accordance with the RoHS Directive 2002/95/EC, and its amendment directives.

**Test Method** : With reference to IEC 62321/2nd CDV (111/95/CDV) Procedures for the Determination of Levels of Regulated Substances in Electrotechnical Products.

- (1) Determination of Cadmium by ICP-AES.
- (2) Determination of Lead by ICP-AES.
- (3) Determination of Mercury by ICP-AES.
- (4) Determination of Hexavalent Chromium for metallic samples by Spot test / boiling water extraction Method.

**Test Result(s)** : Please refer to next page(s).

  
**Nicole Chien / Supervisor**  
**Signed for and on behalf of**  
**SGS TAIWAN LTD.**  
**Chemical Laboratory - Taipei**

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No. : CE/2008/A3638

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Page : 2 of 5

LITTELFUSE INC.  
800 E. NORTHWEST HIGHWAY, DES PLAINES, IL 60016



Test results by chemical method (Unit: mg/kg)

Test Item (s):	Method (Refer to)	Result		MDL
		No.1	No.2	
Cadmium (Cd)	(1)	19	n.d.	2
Lead (Pb)	(2)	48	n.d.	2
Mercury (Hg)	(3)	n.d.	n.d.	2
Hexavalent Chromium Cr(VI) by Spot test / boiling water extraction	(4)	Negative	Negative	See Note 4

## TEST PART DESCRIPTION:

NO.1 : PLATING LAYER OF COPPER COLORED METAL  
NO.2 : BASE MATERIAL OF COPPER COLORED METAL

Note : 1. mg/kg = ppm

2. n.d. = Not Detected

3. MDL = Method Detection Limit

4. Spot-test:

Negative = Absence of Cr(VI) coating / surface layer,

Positive = Presence of Cr(VI) coating / surface layer;

(The tested sample should be further verified by boiling-water-extraction method if the spot test result cannot be confirmed.)

Boiling-water-extraction:

Negative = Absence of Cr(VI) coating / surface layer.

Positive = Presence of Cr(VI) coating / surface layer;

the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm<sup>2</sup> sample surface area.

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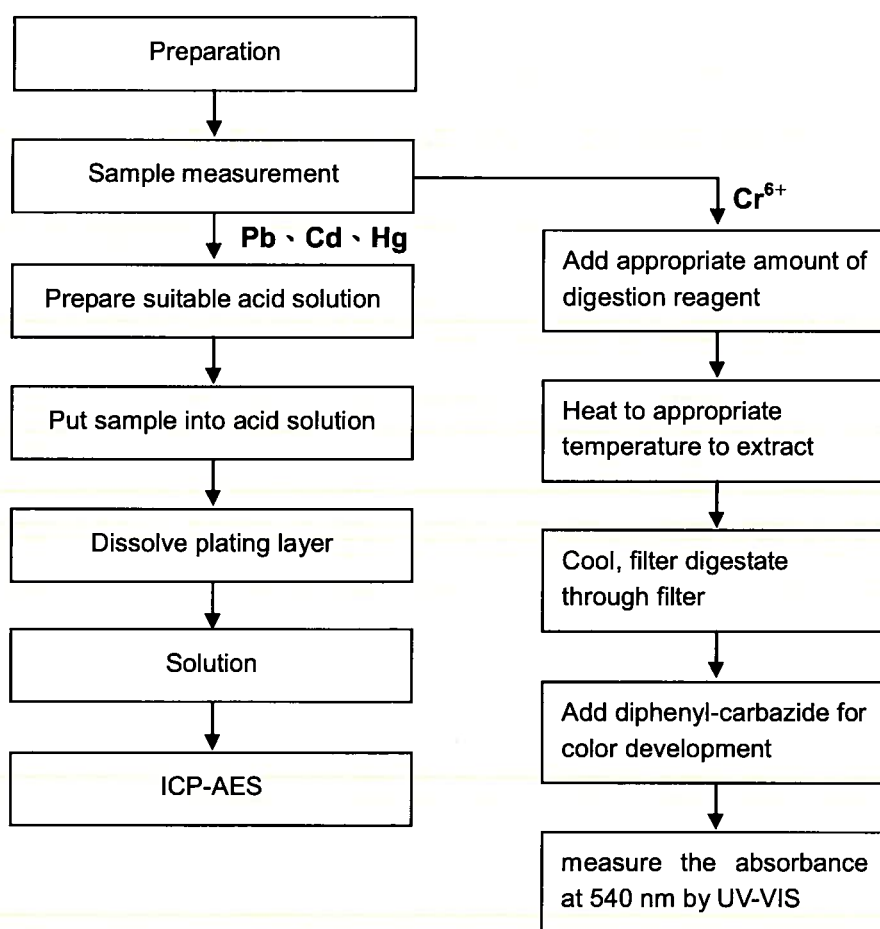
LITTELFUSE INC.

800 E. NORTHWEST HIGHWAY, DES PLAINES, IL 60016



- NO.1
- 1) These samples were dissolved totally by pre-conditioning method according to below flow chart. ( $\text{Cr}^{6+}$  test method excluded)
  - 2) Name of the person who made measurement: Climbgreat Yang
  - 3) Name of the person in charge of measurement: Troy Chang

## Flow Chart of Stripping method for metal analysis



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# Test Report

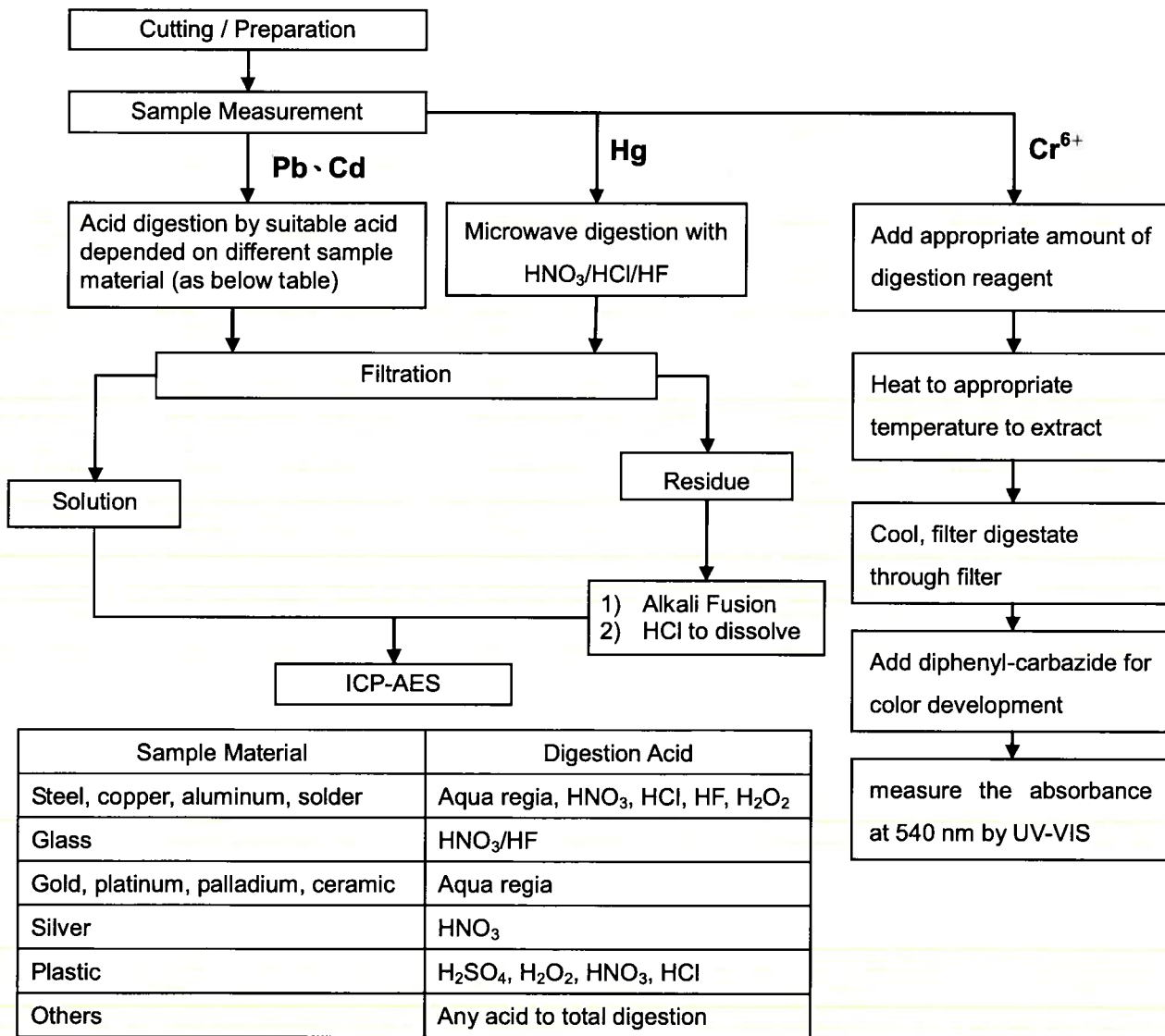
No. : CE/2008/A3638 Date : 2008/10/21

Page : 4 of 5

LITTELFUSE INC.  
800 E. NORTHWEST HIGHWAY, DES PLAINES, IL 60016



- NO.2
- 1) These samples were dissolved totally by pre-conditioning method according to below flow chart.  
(Cr<sup>6+</sup> test method excluded)
  - 2) Name of the person who made measurement: Climbgreat Yang
  - 3) Name of the person in charge of measurement: Troy Chang



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# Test Report

No. : CE/2008/A3638

Date : 2008/10/21

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LITTELFUSE INC.

800 E. NORTHWEST HIGHWAY, DES PLAINES, IL 60016



\*\* End of Report \*\*

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