



ICP Test Report Certification Packet

Company name: Littelfuse, Inc.

Product Series: L600 Series - 600V Fuse Block for Midget Fuses

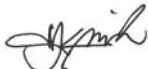
Product #: L600xxx-xC

Issue Date: January 26, 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 L600 Series - 600V Fuse Block for Midget Fuse RoHS-Compliant series products manufactured by Littelfuse, Inc.

< Raw Materials Used

Please see Table 1

(2) The ICP data on all measurable substances

Please see appropriate pages as identified in Table 1

Remarks :

Table 1: List of Raw Materials covered by this report

Total Parts	Raw Material Part Number	Raw Material Description	Page(s)
1	902-124	Headless Screw Set	3-7
2	902-122	Type B Self Tapping Philips	8-12
3	880-012	Copper Box Lug	13-18
4	100062	Fuse Clip	19-24
5	868-069	Fuse Block	25-31



Test Report

Applicant: Littelfuse, Inc.
800 E. NORTHWEST HWY
DESPLAINES IL 60016

Number : TWNC00127040

Date : Sep 29, 2009

Sample Description:

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

Part Description : Headless Screw
(A)Base material
(B)Plating

Part Number : 902-124

Date Sample Received : Jul 30, 2009 / Sep 23, 2009

Date Test Started : Jul 31, 2009 / Sep 23, 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.



Number : TWNC00127040

Test Conducted

(I) Test Result Summary :

<u>Testing Item</u>	<u>Result (ppm)</u>	
	<u>(A)</u>	<u>(B)</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 testing.

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

Date Sample Received : Jul 30, 2009

Testing Period : Sep 23, 2009 To Sep 28, 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 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>Testing Item</u>	<u>Testing 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

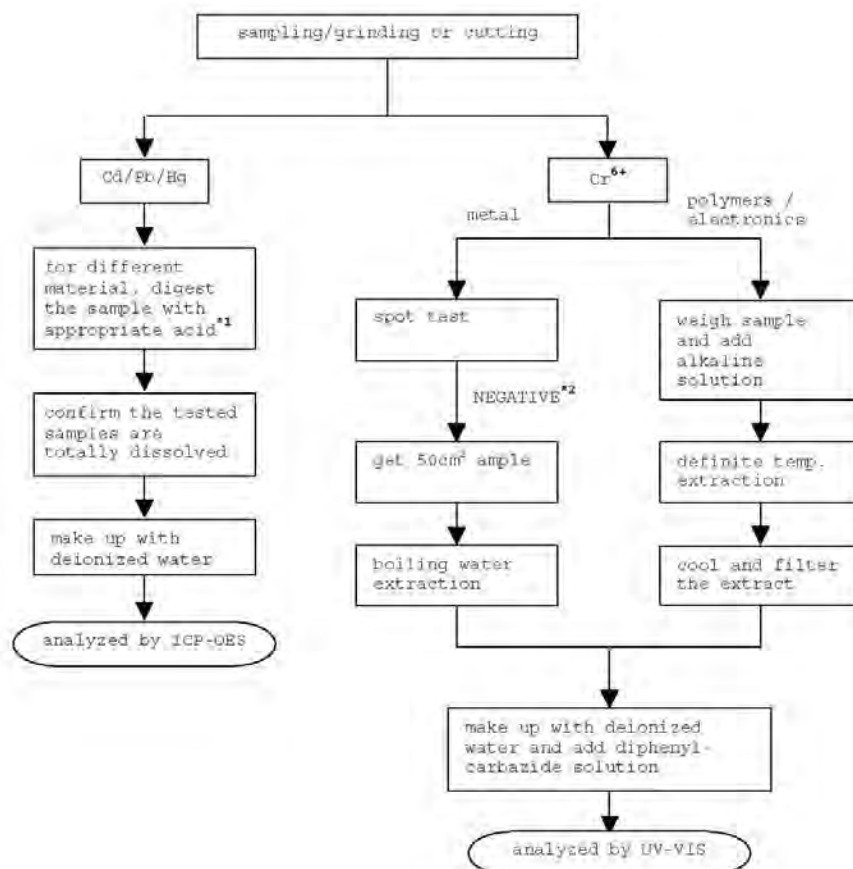
Remark: Reporting limit = Quantitation limit of analyte in sample

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

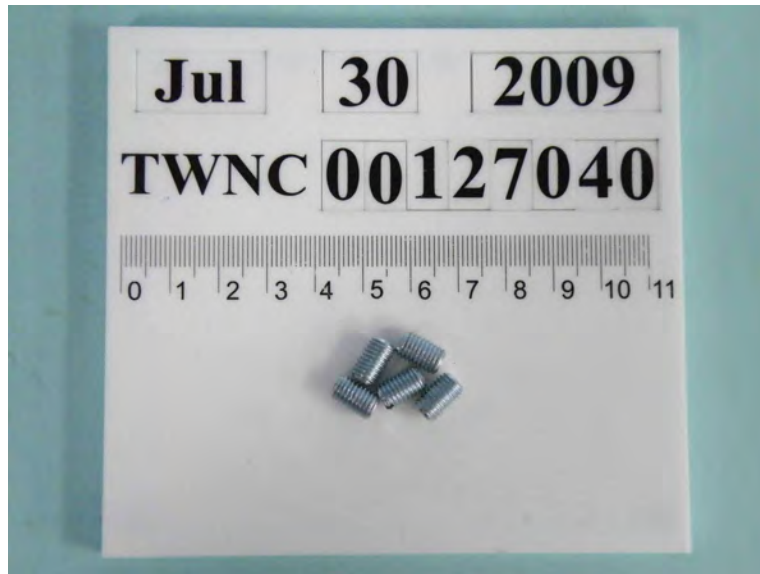
*2: If the result of spot test is positive, Chromium VI would be determined as detected.

End Of Report

Number : TWNC00127040

Test Conducted

Photo



Test Report

No. : CE/2008/A5220 Date : 2008/10/29

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 : SCREW
Style/Item No. : 902-122
Sample Receiving Date : 2008/10/23
Testing Period : 2008/10/23 TO 2008/10/29

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/A5220

Date : 2008/10/29

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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)	22	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 SILVER COLORED METAL SCREW
NO.2 : BASE MATERIAL OF SILVER COLORED METAL SCREW

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 cm² 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

Member of the SGS Group (SGS SA)

Test Report

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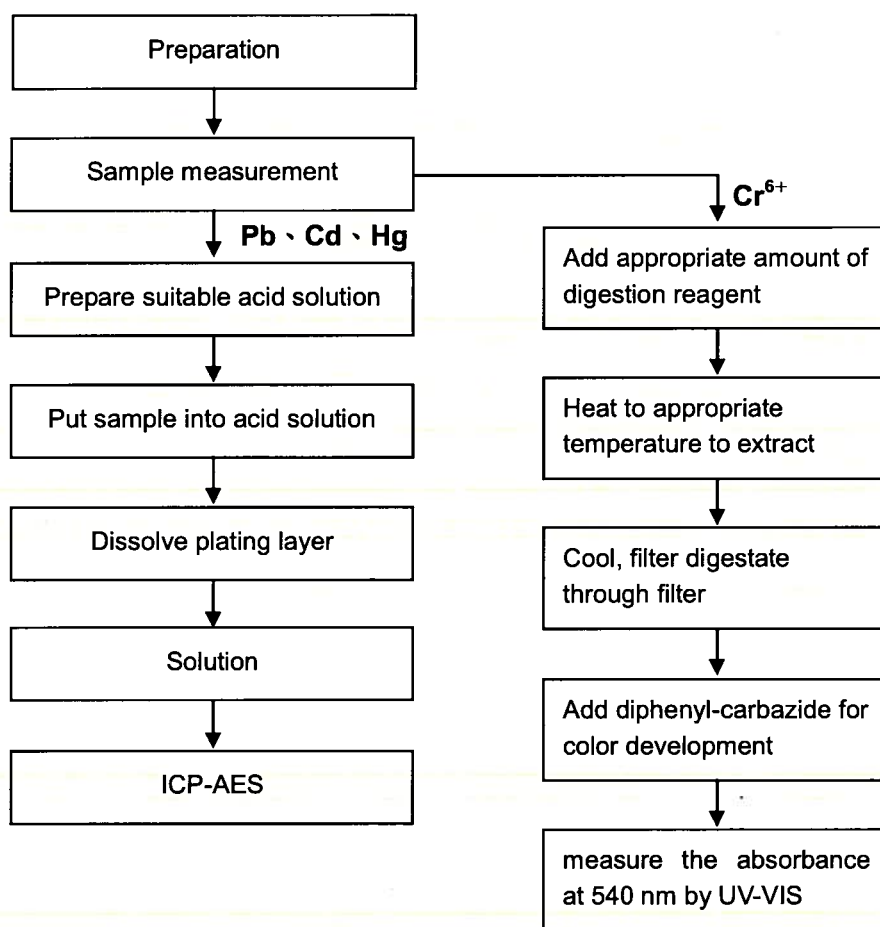
LITTELFUSE INC.

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. (Cr⁶⁺ 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/A5220 Date : 2008/10/29

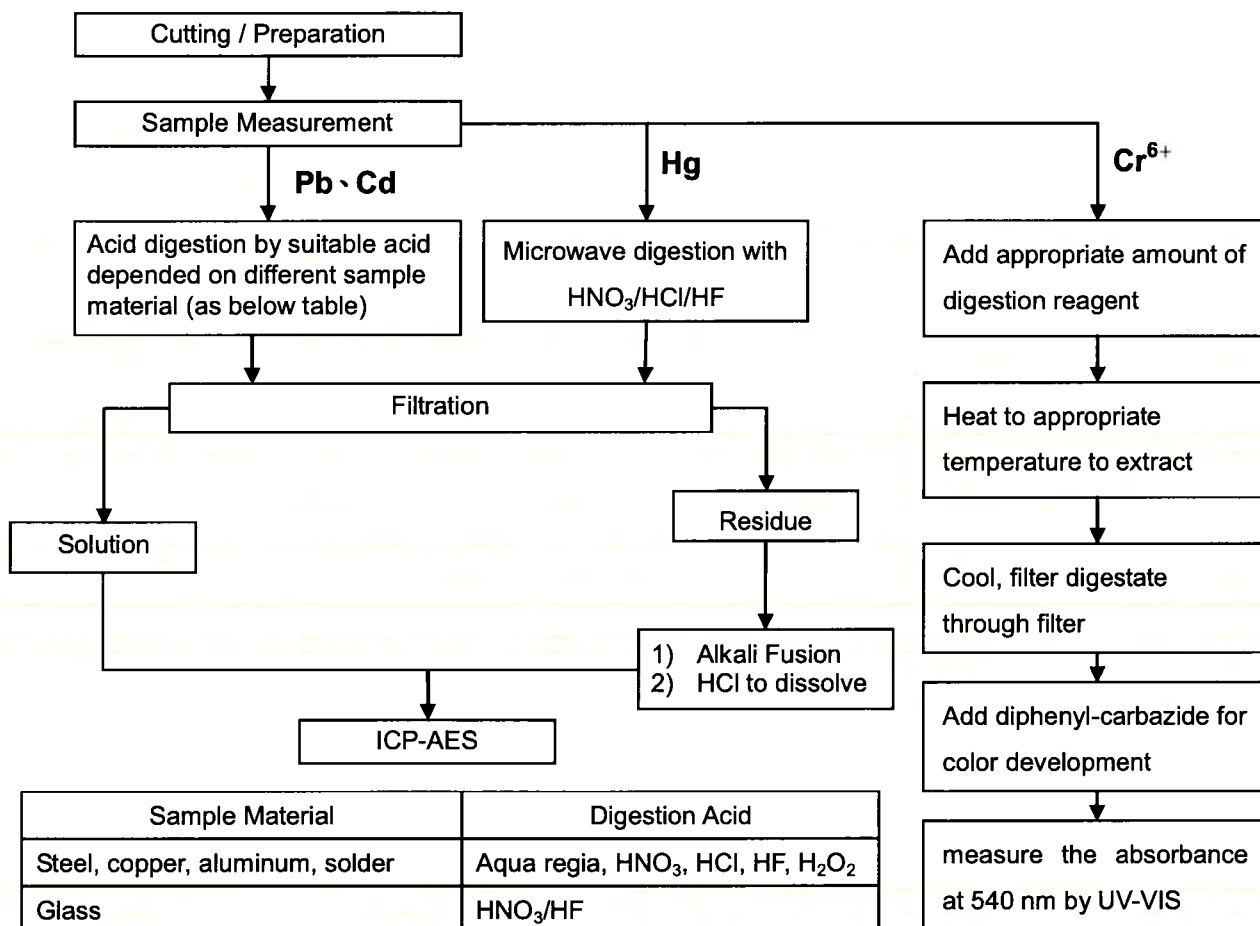
Page : 4 of 5

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.
(Cr⁶⁺ 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 ₃ , HCl, HF, H ₂ O ₂
Glass	HNO ₃ /HF
Gold, platinum, palladium, ceramic	Aqua regia
Silver	HNO ₃
Plastic	H ₂ SO ₄ , H ₂ O ₂ , HNO ₃ , HCl
Others	Any acid to total digestion

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Test Report

No. : CE/2008/A5220 Date : 2008/10/29

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LITTELFUSE INC.

800 E. NORTHWEST HIGHWAY, DES PLAINES, IL 60016



**** End of Report ****

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TEST REPORT

NUMBER : TWNC00104282

APPLICANT: LITTELFUSE, INC.
800 E. NORTHWEST HWY
DESPLAINES IL 60016

DATE : JAN 19, 2009

SAMPLE DESCRIPTION:

ONE (1) GROUP OF SUBMITTED SAMPLES SAID TO BE :

PART DESCRIPTION : COPPER BOX LUG

PART NUMBER : 880-012

FACILITY : PIEDRAS

DATE SAMPLE RECEIVED : JAN 14, 2009

DATE TEST STARTED : JAN 14, 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.



NUMBER : TWNC00104282

TEST CONDUCTED

(I) TEST RESULT SUMMARY :

<u>TESTING ITEM</u>	<u>RESULT (ppm)</u>
	<u>SILVER METAL</u>
HEAVY METAL	
CADMIUM (Cd) CONTENT	ND
LEAD (Pb) CONTENT	11
MERCURY (Hg) CONTENT	ND
CHROMIUM VI (Cr ⁶⁺) CONTENT	ND

REMARKS : ppm = PARTS PER MILLION BASED ON WEIGHT OF TESTED SAMPLE
ND = NOT DETECTED

RESPONSIBILITY OF CHEMIST: IRENE CHIOU / KEVIN LIU

DATE SAMPLE RECEIVED : JAN 14, 2009

TESTING PERIOD : JAN 14, 2009 TO JAN 17, 2009

(II) ROHS REQUIREMENT :

<u>RESTRICTED SUSTANCES</u>	<u>LIMITS</u>
CADMIUM (Cd)	0.01% (100ppm)
LEAD (Pb)	0.1% (1000ppm)
MERCURY (Hg)	0.1% (1000ppm)
CHROMIUM (VI) (Cr ⁶⁺)	0.1% (1000ppm)



NUMBER : TWNC00104282

TEST CONDUCTED

(III) TEST METHOD :

TESTING ITEM	TESTING METHOD	REPORTING LIMIT
CADMIUM (Cd) CONTENT	WITH REFERENCE TO IEC 62321-111/95/CDV IN CLAUES 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 62321-111/95/CDV IN CLAUES 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 62321-111/95/CDV IN CLAUES 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 USEPA 3060A & 7196A, BY ALKALINE DIGESTION AND DETERMINED BY UV-VIS SPECTROPHOTOMETER	1 ppm

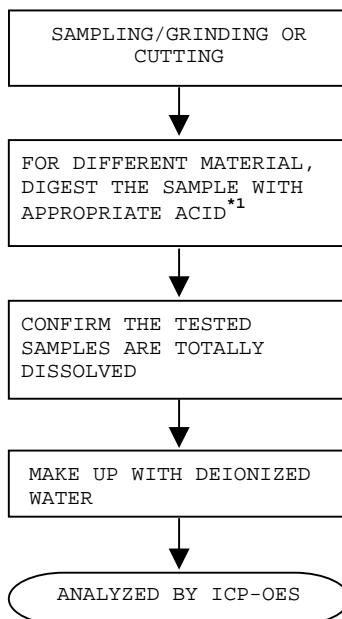
REMARKS : REPORTING LIMIT = QUANTITATION LIMIT OF ANALYTE IN SAMPLE
TESTS WERE CONDUCTED WITH REFERENCE TO 111/95/CDV VERSION 2007-10-12 WHICH IS STILL A DRAFT METHOD AND SUBJECT TO FUTURE
CHANGES PRIOR TO PUBLICATION.

TEST CONDUCTED

(IV) MEASUREMENT FLOWCHART:

TEST FOR Cd/Pb/Hg

REFERENCE STANDARD : IEC 62321 (111/95/CDV)



REMARKS:

*1: LIST OF APPROPRIATE ACID :

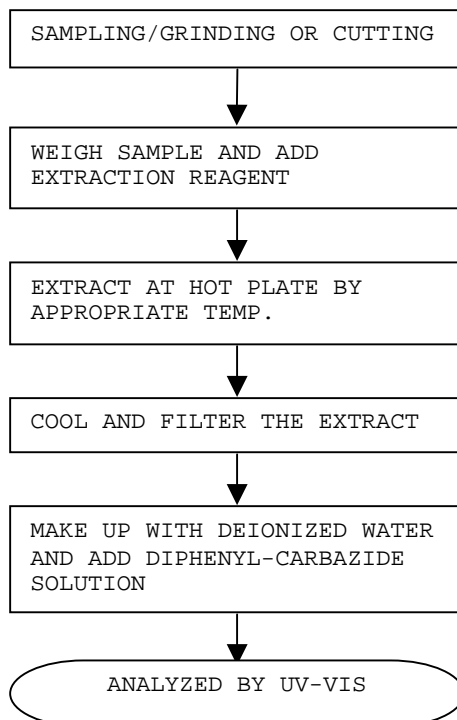
MATERIAL	ACID ADDED FOR DIGESTION
POLYMERS	HNO ₃ , HCl, HF, H ₂ O ₂ , H ₃ BO ₃
METALS	HNO ₃ , HCl, HF
ELECTRONICS	HNO ₃ , HCl, H ₂ O ₂ , HBF ₄

TEST CONDUCTED

(IV) MEASUREMENT FLOWCHART:

TEST FOR CHROMIUM (VI) CONTENT

REFERENCE STANDARD : USEPA 3060A/7196A



END OF REPORT

NUMBER : TWNC00104282

TEST CONDUCTED

PHOTO





TEST REPORT

NUMBER : TWNC00104284

APPLICANT: LITTELFUSE, INC.
800 E. NORTHWEST HWY
DESPLAINES IL 60016

DATE : JAN 19, 2009

SAMPLE DESCRIPTION:

ONE (1) GROUP OF SUBMITTED SAMPLES SAID TO BE :
PART DESCRIPTION : CLASS CC FUSE CLIP
PART NUMBER : 100062
FACILITY : PIEDRAS
DATE SAMPLE RECEIVED : JAN 14, 2009
DATE TEST STARTED : JAN 14, 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.



NUMBER : TWNC00104284

TEST CONDUCTED

(I) TEST RESULT SUMMARY :

<u>TESTING ITEM</u>	<u>RESULT (ppm)</u>
	<u>SILVER METAL</u>
HEAVY METAL	
CADMIUM (Cd) CONTENT	ND
LEAD (Pb) CONTENT	11
MERCURY (Hg) CONTENT	ND
CHROMIUM VI (Cr ⁶⁺) CONTENT	ND

REMARKS : ppm = PARTS PER MILLION BASED ON WEIGHT OF TESTED SAMPLE
ND = NOT DETECTED

RESPONSIBILITY OF CHEMIST: IRENE CHIOU / KEVIN LIU

DATE SAMPLE RECEIVED : JAN 14, 2009

TESTING PERIOD : JAN 14, 2009 TO JAN 17, 2009

(II) ROHS REQUIREMENT :

<u>RESTRICTED SUSTANCES</u>	<u>LIMITS</u>
CADMIUM (Cd)	0.01% (100ppm)
LEAD (Pb)	0.1% (1000ppm)
MERCURY (Hg)	0.1% (1000ppm)
CHROMIUM (VI) (Cr ⁶⁺)	0.1% (1000ppm)



NUMBER : TWNC00104284

TEST CONDUCTED

(III) TEST METHOD :

TESTING ITEM	TESTING METHOD	REPORTING LIMIT
CADMIUM (Cd) CONTENT	WITH REFERENCE TO IEC 62321-111/95/CDV IN CLAUES 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 62321-111/95/CDV IN CLAUES 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 62321-111/95/CDV IN CLAUES 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 USEPA 3060A & 7196A, BY ALKALINE DIGESTION AND DETERMINED BY UV-VIS SPECTROPHOTOMETER	1 ppm

REMARKS : REPORTING LIMIT = QUANTITATION LIMIT OF ANALYTE IN SAMPLE
TESTS WERE CONDUCTED WITH REFERENCE TO 111/95/CDV VERSION 2007-10-12 WHICH IS STILL A DRAFT METHOD AND SUBJECT TO FUTURE
CHANGES PRIOR TO PUBLICATION.

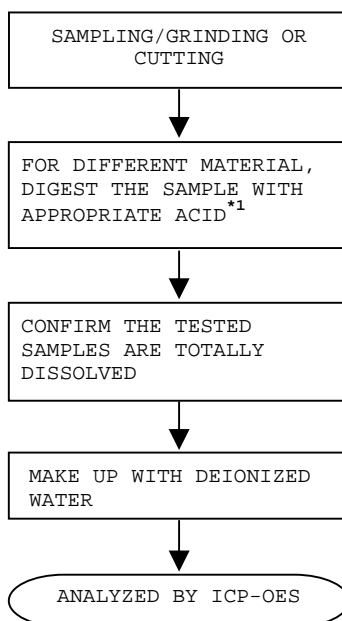
NUMBER : TWNC00104284

TEST CONDUCTED

(IV) MEASUREMENT FLOWCHART:

TEST FOR Cd/Pb/Hg

REFERENCE STANDARD : IEC 62321 (111/95/CDV)



REMARKS:

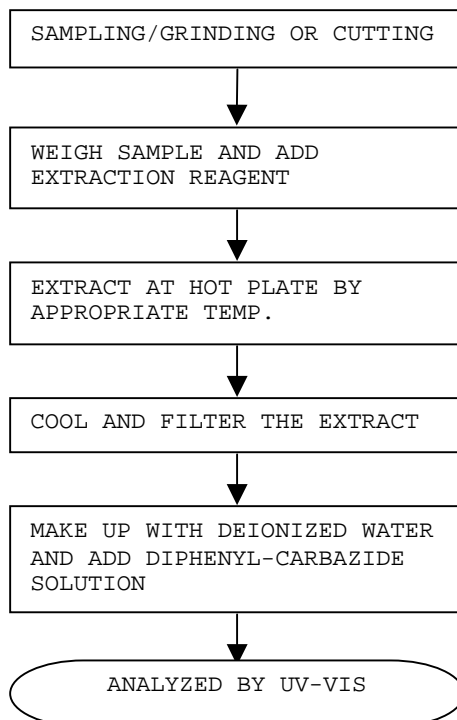
*1: LIST OF APPROPRIATE ACID :

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

TEST CONDUCTED

(IV) MEASUREMENT FLOWCHART:

TEST FOR CHROMIUM (VI) CONTENT
REFERENCE STANDARD : USEPA 3060A/7196A



END OF REPORT

NUMBER : TWNC00104284

TEST CONDUCTED

PHOTO





Test Report

No. : CE/2008/A5212 Date : 2008/10/29 Page : 1 of 7

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 : FUSEHOLDER
Style/Item No. : 868-069
Sample Receiving Date : 2008/10/23
Testing Period : 2008/10/23 TO 2008/10/29

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/A5212 Date : 2008/10/29 Page : 2 of 7

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



Test Result(s)

PART NAME NO.1 : BLACK PLASTIC WITH WHITE PRINTED

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	13
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	n.d.
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	61800
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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LITTELFUSE INC.

800 E. NORTHWEST HIGHWAY, DES PLAINES, IL 60016



Test Item (s):	Unit	Method	MDL	Result No.1
Sum of PBBs	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.
Sum of PBDEs			-	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

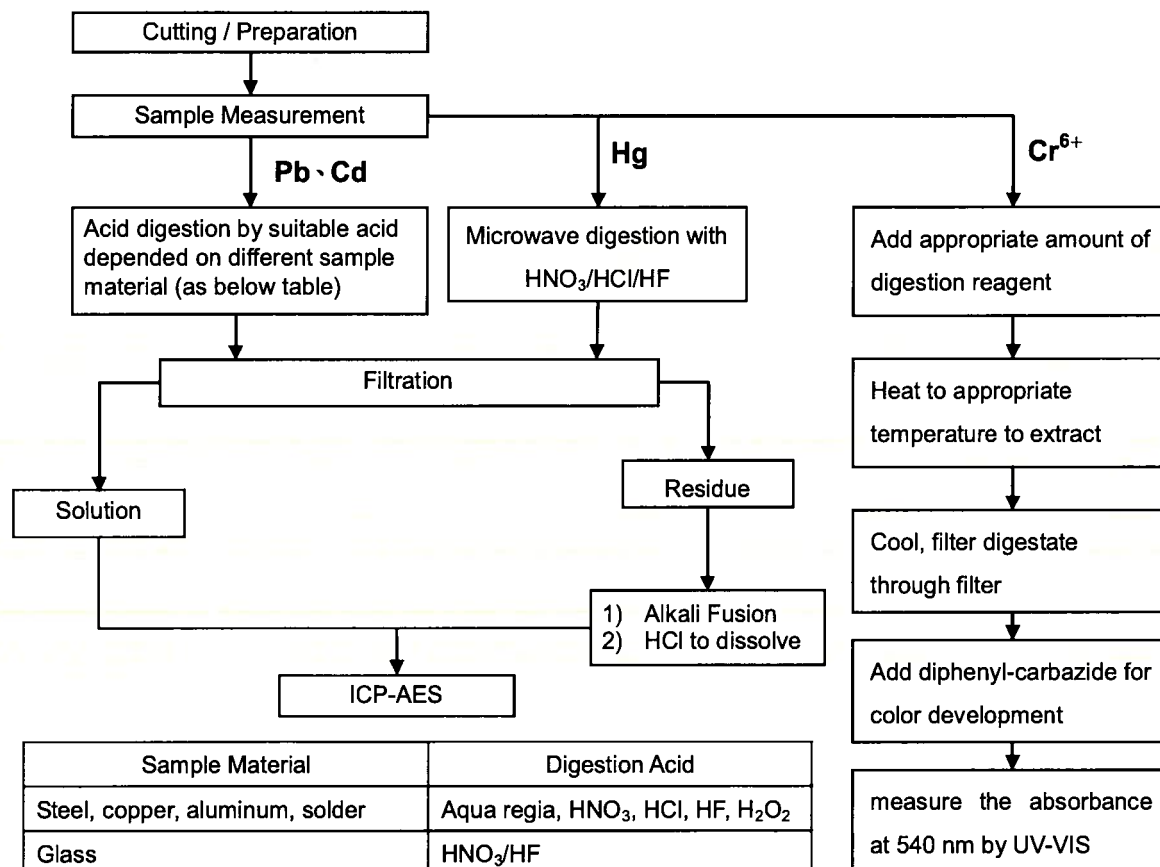
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LITTELFUSE INC.

800 E. NORTHWEST HIGHWAY, DES PLAINES, IL 60016



- 1) These samples were dissolved totally by pre-conditioning method according to below flow chart.
(Cr⁶⁺ 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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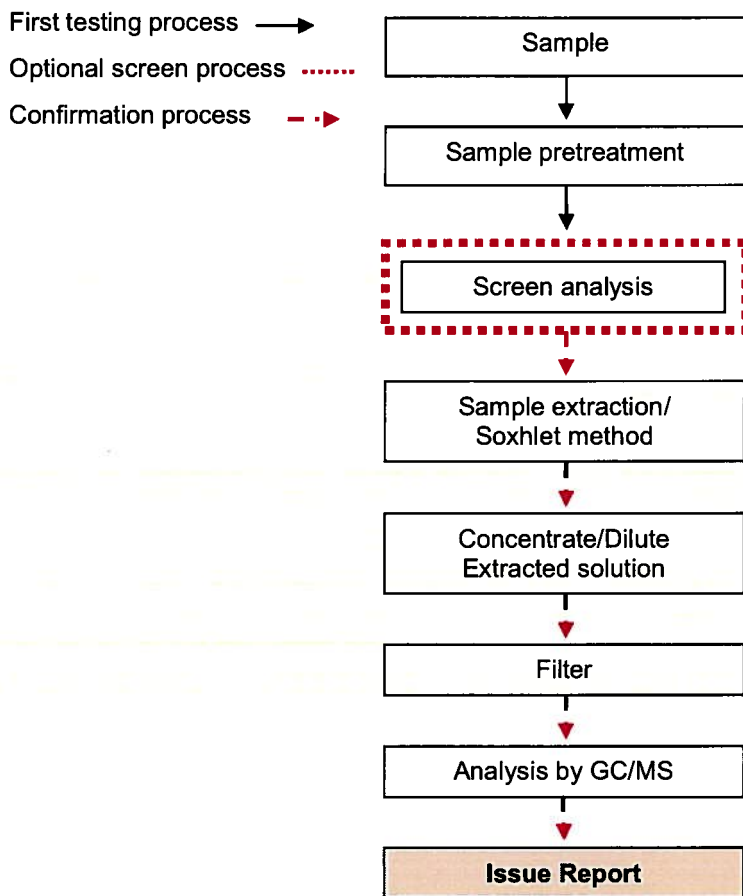
LITTELFUSE INC.

800 E. NORTHWEST HIGHWAY, DES PLAINES, IL 60016



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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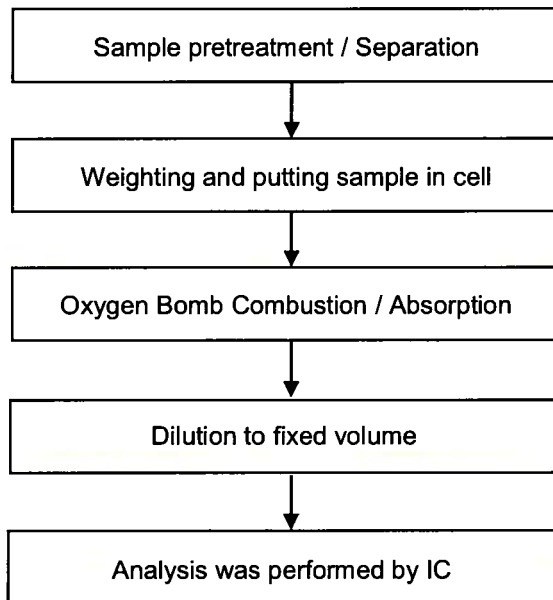
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Analytical flow chart of halogen content

- 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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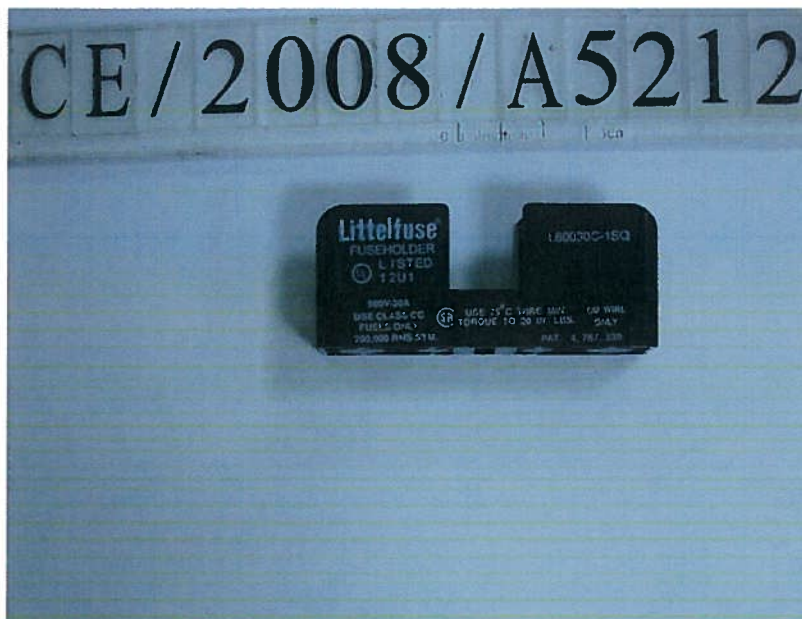
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**** End of Report ****

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