



ICP Test Report Certification Packet

Company Name: Littelfuse, Inc.

Product Type: Surface Mount Varistors

Product Series: MHS/MLE/ML/AUML Series (except size 2220)

Issue Date: Oct. 13, 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: *David Huang*

< DGLF Environmental, Health & Safety Engineer >

(1) Parts, sub-materials and unit parts

This document covers the Surface Mount Varistors MHS/MLE/ML/AUML (except size 2220) compliant series products manufactured by Littelfuse, Inc.

Please see Table 1 for raw materials used.

(2) The ICP data on all measurable substances

Please see appropriate pages as identified in Table 1

Remarks :

Pb (lead) contained in glass of electronic components and is categorized as exempt under section 5 of the RoHS Annex.



Table 1: List of Raw Materials covered by this report

Total Parts	Raw Material P/N	Raw Material Description	Page
1	N/A	BLACK CHIP, except size 2220	3-7
2	N/A	5450T or 2257D(MS208) TERMINATIONS	8-21
3	N/A	NICKEL PLATE	22-25
4	N/A	TIN PLATE	26-29



**TEST REPORT**

NUMBER: SZHH0049776111

APPLICANT: LITTELFUSE, INC.  
8755 WEST HIGGINS ROAD SUITE 500  
CHICAGO IL 60631 USA

DATE: Jun 19, 2010

ATTN: KRISTEEN BACILA/ARSENIO CESISTA JR.

**SAMPLE DESCRIPTION:**

ONE (1) SUBMITTED SAMPLE SAID TO BE **BLACK CHIP**.  
TESTED COMPONENT : GREY SOLID.  
PART DESCRIPTION : BLACK CHIP.  
DATE SAMPLE RECEIVED : JUN 12, 2010.  
DATE TEST STARTED : JUN 12, 2010.



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**TESTS CONDUCTED:**

AS REQUESTED BY THE APPLICANT, FOR DETAILS REFER TO ATTACHED PAGE(S)

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AUTHORIZED BY:  
FOR INTERTEK TESTING SERVICES  
SHENZHEN LTD.



KARBON M.Y. WU  
GENERAL MANAGER



**TEST REPORT**

NUMBER: SZHH0049776111

TESTS CONDUCTED

RoHS CHEMICAL TEST

(A) TEST RESULT SUMMARY:

TESTING ITEM	RESULT
CADMIUM (Cd) CONTENT (mg/kg)	ND (<2)
LEAD (Pb) CONTENT (mg/kg)	1500
MERCURY (Hg) CONTENT (mg/kg)	ND (<2)
CHROMIUM (VI)(Cr <sup>6+</sup> ) CONTENT (mg/kg)	17
POLYBROMINATED BIPHENYLS (PBBs) (mg/kg)	
MONOBROMOBIPHENYL (MonoBB)	ND (<5)
DIBROMOBIPHENYL (DiBB)	ND (<5)
TRIBROMOBIPHENYL (TriBB)	ND (<5)
TETRABROMOBIPHENYL (TetraBB)	ND (<5)
PENTABROMOBIPHENYL (PentaBB)	ND (<5)
HEXABROMOBIPHENYL (HexaBB)	ND (<5)
HEPTABROMOBIPHENYL (HeptaBB)	ND (<5)
OCTABROMOBIPHENYL (OctaBB)	ND (<5)
NONABROMOBIPHENYL (NonaBB)	ND (<5)
DECABROMOBIPHENYL (DecaBB)	ND (<5)
POLYBROMINATED DIPHENYL ETHERS (PBDEs) (mg/kg)	
MONOBROMODIPHENYL ETHER (MonoBDE)	ND (<5)
DIBROMODIPHENYL ETHER (DiBDE)	ND (<5)
TRIBROMODIPHENYL ETHER (TriBDE)	ND (<5)
TETRABROMODIPHENYL ETHER (TetraBDE)	ND (<5)
PENTABROMODIPHENYL ETHER (PentaBDE)	ND (<5)
HEXABROMODIPHENYL ETHER (HexaBDE)	ND (<5)
HEPTABROMODIPHENYL ETHER (HeptaBDE)	ND (<5)
OCTABROMODIPHENYL ETHER (OctaBDE)	ND (<5)
NONABROMODIPHENYL ETHER (NonaBDE)	ND (<5)
DECABROMODIPHENYL ETHER (DecaBDE)	ND (<5)

CHEMIST: LV LINNA

mg/kg = MILLIGRAM PER KILOGRAM = ppm

< = LESS THAN

ND = NOT DETECTED

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**TEST REPORT**

NUMBER: SZHH0049776111

TESTS CONDUCTED

(B) RoHS REQUIREMENT:

RESTRICTED SUBSTANCES	LIMITS
CADMIUM (Cd)	0.01% (100 ppm)
LEAD (Pb)	0.1% (1000 ppm)
MERCURY (Hg)	0.1% (1000 ppm)
CHROMIUM (VI) (Cr <sup>6+</sup> )	0.1% (1000 ppm)
POLYBROMINATED BIPHENYLS (PBBs)	0.1% (1000 ppm)
POLYBROMINATED DIPHENYL ETHERS (PBDEs)	0.1% (1000 ppm)

THE ABOVE LIMITS WERE QUOTED FROM 2002/95/EC AND AMENDMENT 2005/618/EC FOR HOMOGENEOUS MATERIAL.

(C) TEST METHOD:

TESTING ITEM	TESTING METHOD	REPORTING LIMIT
CADMIUM (Cd) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008, BY ACID DIGESTION AND DETERMINED BY ICP - OES	2 mg/kg
LEAD (Pb) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008, BY ACID DIGESTION AND DETERMINED BY ICP - OES	2 mg/kg
MERCURY (Hg) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008, BY ACID DIGESTION AND DETERMINED BY ICP - OES	2 mg/kg
CHROMIUM (VI) (Cr <sup>6+</sup> ) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008, BY ALKALINE DIGESTION AND DETERMINED BY UV-VIS SPECTROPHOTOMETER	1 mg/kg
POLYBROMINATED BIPHENYLS (PBBs) & POLYBROMINATED DIPHENYL ETHERS (PBDEs)	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008, BY SOLVENT EXTRACTION AND DETERMINED BY GC/MS AND FURTHER HPLC CONFIRMATION WHEN NECESSARY	5 mg/kg

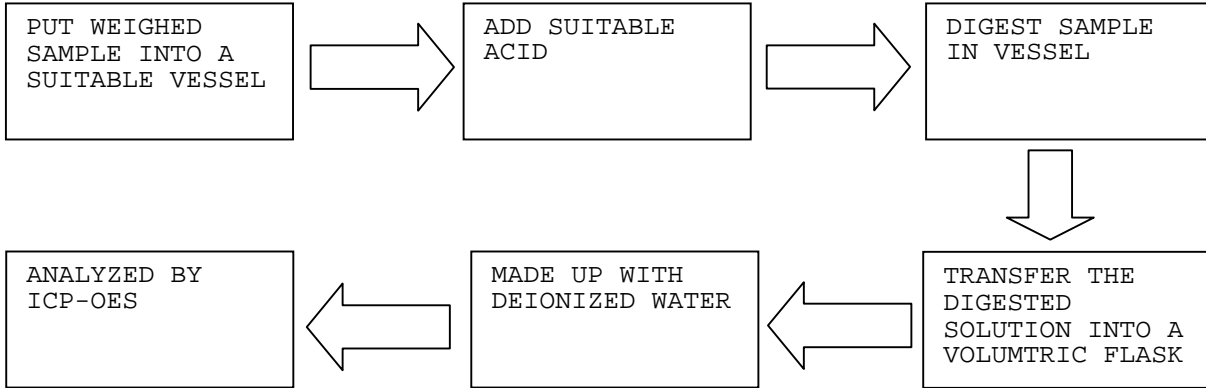
DATE SAMPLE RECEIVED : JUN 12, 2010  
TESTING PERIOD : JUN 12, 2010 TO JUN 17, 2010

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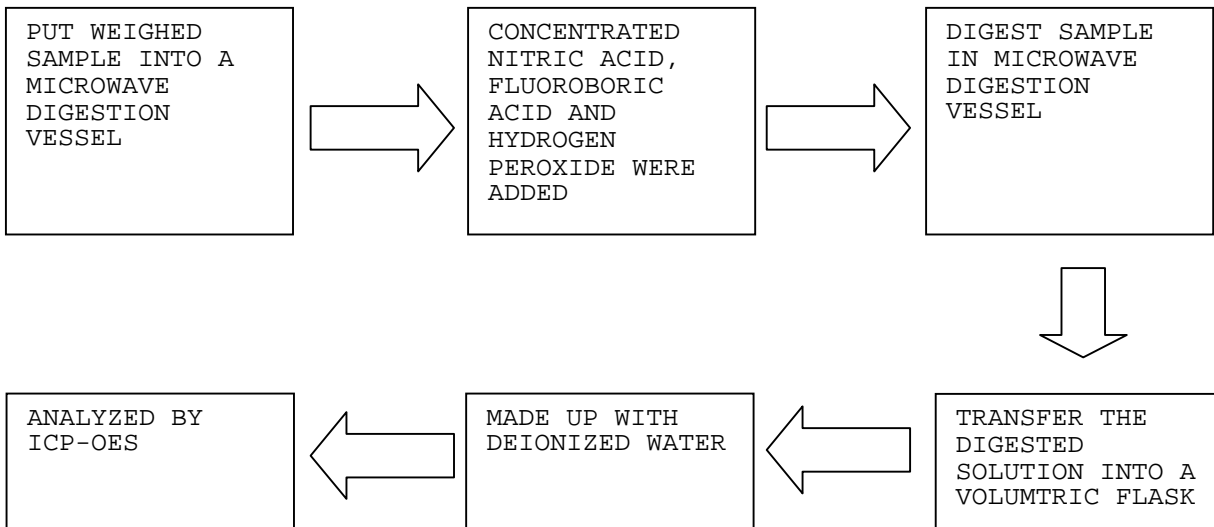
TESTS CONDUCTED

(D) MEASUREMENT FLOWCHART:

1. TEST FOR Cd/Pb CONTENTS



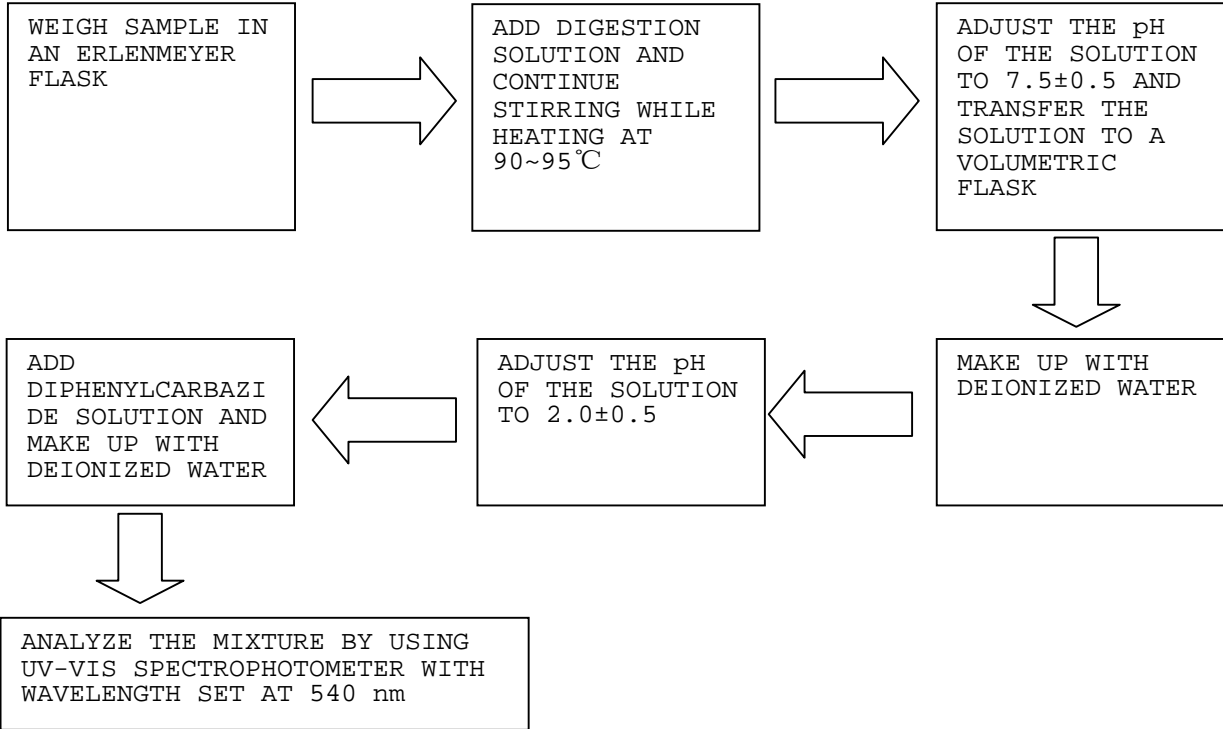
2. TEST FOR Hg CONTENT



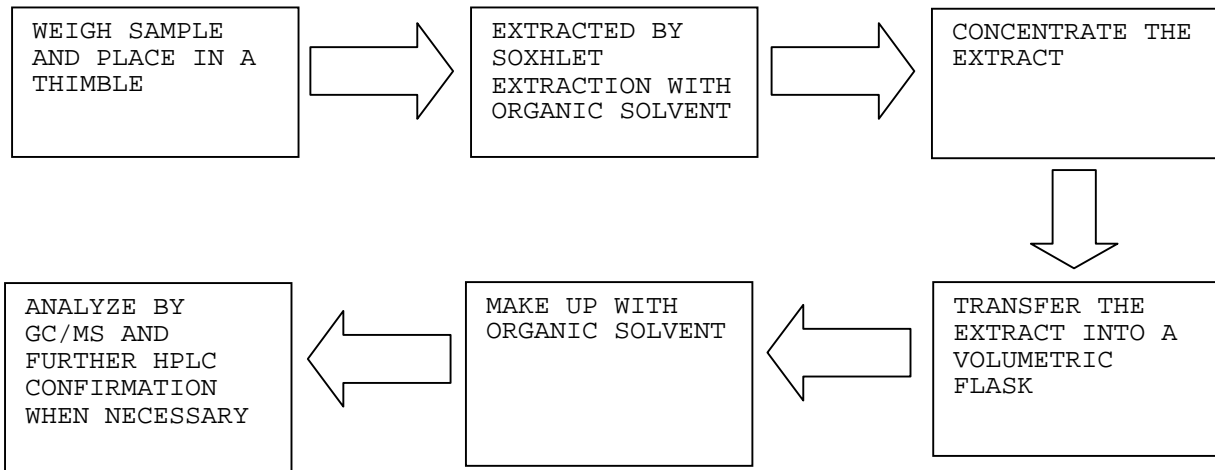
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TESTS CONDUCTED

3. TEST FOR CHROMIUM (VI) (Cr<sup>6+</sup>) CONTENT (ALKALINE DIGESTION)



4. TEST FOR PBBs/PBDEs CONTENTS



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END OF REPORT



**TEST REPORT**

NUMBER: SZHH0052168604

APPLICANT: LITTELFUSE, INC.  
8755 WEST HIGGINS ROAD SUITE  
500 CHICAGO IL 60631 USA

DATE: Sep 01, 2010

ATTN: KRISTEEN BACILA/ARSENIO CESISTA JR.

**SAMPLE DESCRIPTION:**

ONE (1) SUBMITTED SAMPLE SAID TO BE **GREY LIQUID**.  
PART DESCRIPTION : SILVER PASTE.  
PART NUMBER : 5450T.  
DATE SAMPLE RECEIVED : AUG 26, 2010.  
DATE TEST STARTED : AUG 26, 2010.



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**TESTS CONDUCTED:**

AS REQUESTED BY THE APPLICANT, FOR DETAILS REFER TO ATTACHED PAGE(S)

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AUTHORIZED BY:  
FOR INTERTEK TESTING SERVICES  
SHENZHEN LTD.


BEN N.L. LIN  
GENERAL MANAGER





**TEST REPORT**

NUMBER: SZHH0052168604

TESTS CONDUCTED

1 RoHS CHEMICAL TEST

(A) TEST RESULT SUMMARY:

TESTING ITEM	RESULT
CADMIUM (Cd) CONTENT (mg/kg)	ND (<2)
LEAD (Pb) CONTENT (mg/kg)	ND (<2)
MERCURY (Hg) CONTENT (mg/kg)	ND (<2)
CHROMIUM (VI)(Cr <sup>6+</sup> ) CONTENT (mg/kg)	ND (<1)
POLYBROMINATED BIPHENYLS (PBBs) (mg/kg)	
MONOBROMOBIPHENYL (MonoBB)	ND (<5)
DIBROMOBIPHENYL (DiBB)	ND (<5)
TRIBROMOBIPHENYL (TriBB)	ND (<5)
TETRABROMOBIPHENYL (TetraBB)	ND (<5)
PENTABROMOBIPHENYL (PentaBB)	ND (<5)
HEXABROMOBIPHENYL (HexaBB)	ND (<5)
HEPTABROMOBIPHENYL (HeptaBB)	ND (<5)
OCTABROMOBIPHENYL (OctaBB)	ND (<5)
NONABROMOBIPHENYL (NonaBB)	ND (<5)
DECABROMOBIPHENYL (DecaBB)	ND (<5)
POLYBROMINATED DIPHENYL ETHERS (PBDEs) (mg/kg)	
MONOBROMODIPHENYL ETHER (MonoBDE)	ND (<5)
DIBROMODIPHENYL ETHER (DiBDE)	ND (<5)
TRIBROMODIPHENYL ETHER (TriBDE)	ND (<5)
TETRABROMODIPHENYL ETHER (TetraBDE)	ND (<5)
PENTABROMODIPHENYL ETHER (PentaBDE)	ND (<5)
HEXABROMODIPHENYL ETHER (HexaBDE)	ND (<5)
HEPTABROMODIPHENYL ETHER (HeptaBDE)	ND (<5)
OCTABROMODIPHENYL ETHER (OctaBDE)	ND (<5)
NONABROMODIPHENYL ETHER (NonaBDE)	ND (<5)
DECABROMODIPHENYL ETHER (DecaBDE)	ND (<5)

CHEMIST: LV LINNA

mg/kg = MILLIGRAM PER KILOGRAM BASED ON DRY WEIGHT OF SAMPLE = ppm

< = LESS THAN

ND = NOT DETECTED

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**TEST REPORT**

NUMBER: SZHH0052168604

TESTS CONDUCTED

(B) RoHS REQUIREMENT:

RESTRICTED SUBSTANCES	LIMITS
CADMIUM (Cd)	0.01% (100 ppm)
LEAD (Pb)	0.1% (1000 ppm)
MERCURY (Hg)	0.1% (1000 ppm)
CHROMIUM (VI) (Cr <sup>6+</sup> )	0.1% (1000 ppm)
POLYBROMINATED BIPHENYLS (PBBs)	0.1% (1000 ppm)
POLYBROMINATED DIPHENYL ETHERS (PBDEs)	0.1% (1000 ppm)

THE ABOVE LIMITS WERE QUOTED FROM 2002/95/EC AND AMENDMENT 2005/618/EC FOR HOMOGENEOUS MATERIAL.

(C) TEST METHOD:

TESTING ITEM	TESTING METHOD	REPORTING LIMIT
CADMIUM (Cd) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008, BY ACID DIGESTION AND DETERMINED BY ICP - OES	2 mg/kg
LEAD (Pb) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008, BY ACID DIGESTION AND DETERMINED BY ICP - OES	2 mg/kg
MERCURY (Hg) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008, BY ACID DIGESTION AND DETERMINED BY ICP - OES	2 mg/kg
CHROMIUM (VI) (Cr <sup>6+</sup> ) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008, BY ALKALINE DIGESTION AND DETERMINED BY UV-VIS SPECTROPHOTOMETER	1 mg/kg
POLYBROMINATED BIPHENYLS (PBBs) & POLYBROMINATED DIPHENYL ETHERS (PBDEs)	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008, BY SOLVENT EXTRACTION AND DETERMINED BY GC/MS AND FURTHER HPLC CONFIRMATION WHEN NECESSARY	5 mg/kg

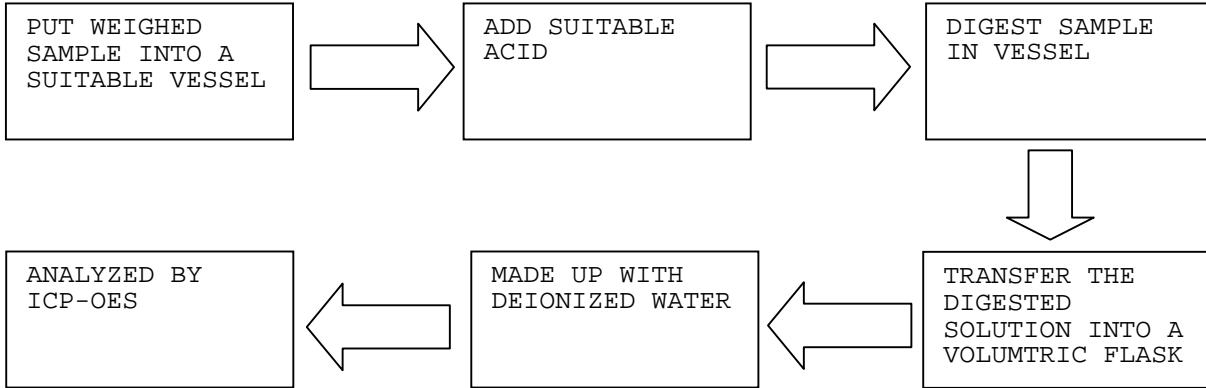
DATE SAMPLE RECEIVED : AUG 26, 2010  
TESTING PERIOD : AUG 26, 2010 TO AUG 30, 2010

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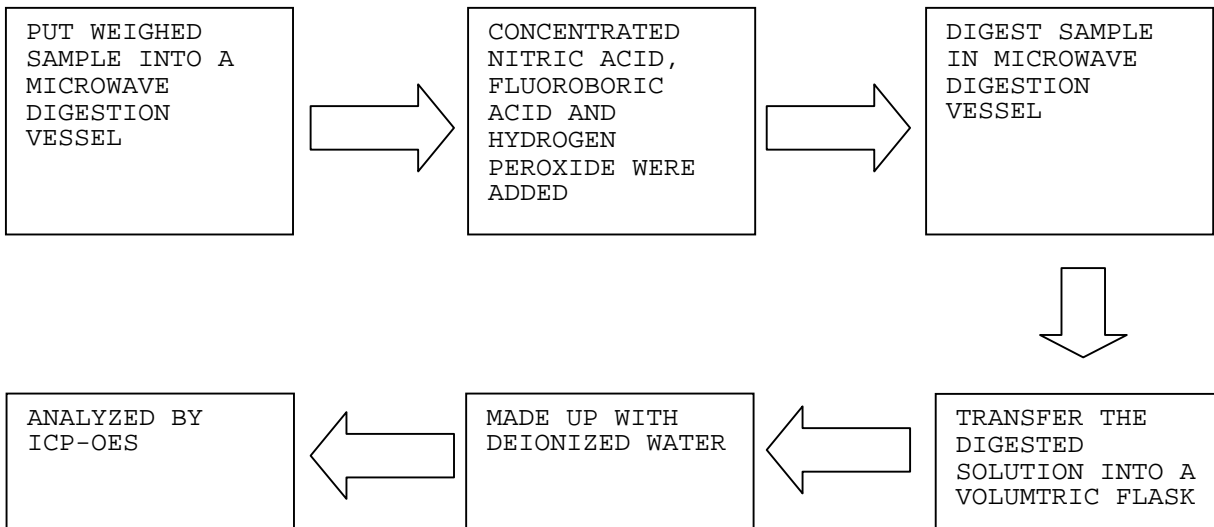
TESTS CONDUCTED

(D) MEASUREMENT FLOWCHART:

1. TEST FOR Cd/Pb CONTENTS



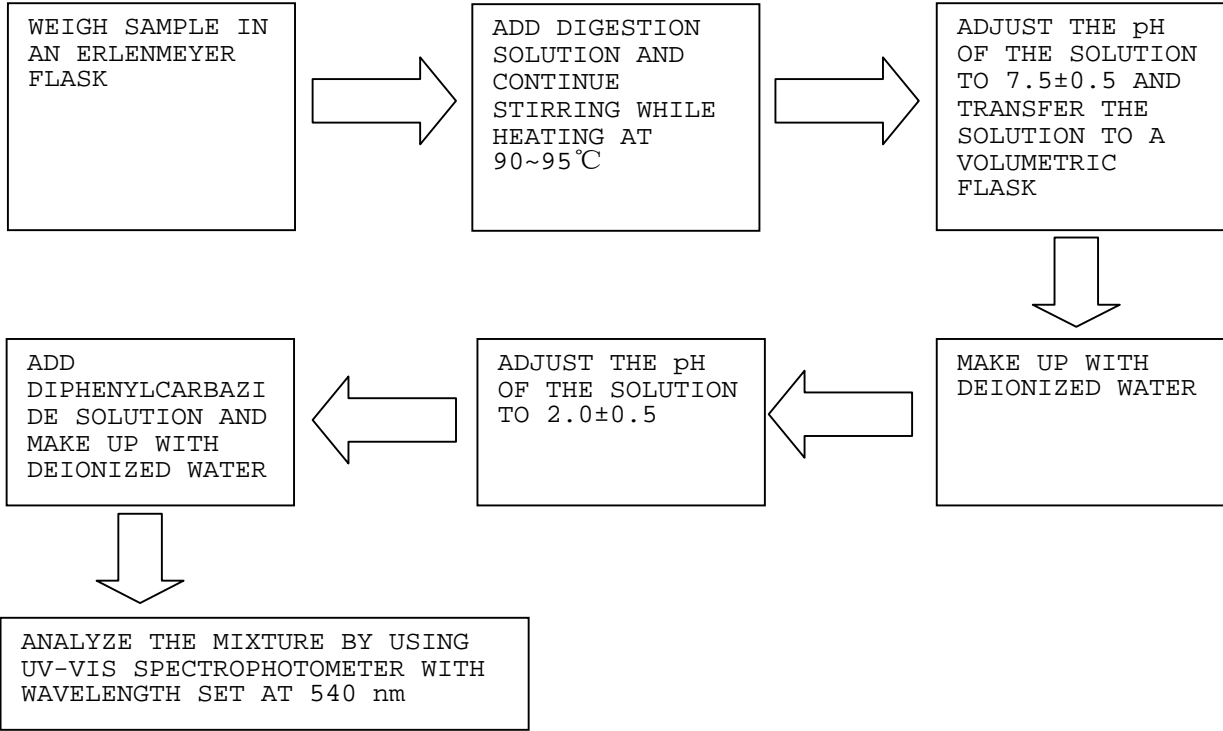
2. TEST FOR Hg CONTENT



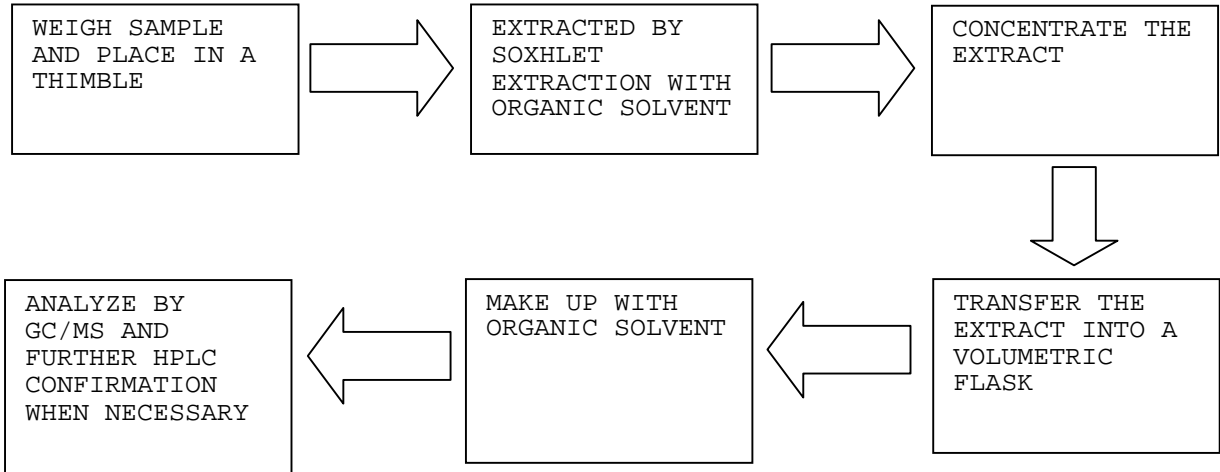
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TESTS CONDUCTED

3. TEST FOR CHROMIUM (VI) (Cr<sup>6+</sup>) CONTENT (ALKALINE DIGESTION)



4. TEST FOR PBBs/PBDEs CONTENTS



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**TEST REPORT**

NUMBER: SZHH0052168604

TESTS CONDUCTED

2 ( I ) TEST RESULT SUMMARY :

HALOGEN CONTENT :

<u>TESTING ITEM</u>	<u>RESULT (ppm)</u>
FLUORINE (F) CONTENT	ND
CHLORINE (Cl) CONTENT	64
BROMINE (Br) CONTENT	ND
IODINE (I) CONTENT	ND

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

( II ) TEST METHOD :

<u>TESTING ITEM</u>	<u>TESTING METHOD</u>	<u>REPORTING LIMIT</u>
HALOGEN (F, Cl, Br, I) CONTENT	WITH REFERENCE TO BS EN 14582:2007 BY CALORIMETRIC BOMB AND DETERMINED BY ION CHROMATOGRAPHY	50 ppm

REMARK : REPORTING LIMIT = QUANTITATION LIMIT OF ANALYTE IN SAMPLE

DATE SAMPLE RECEIVED : AUG 26, 2010  
 TESTING PERIOD : AUG 26, 2010 TO AUG 30, 2010

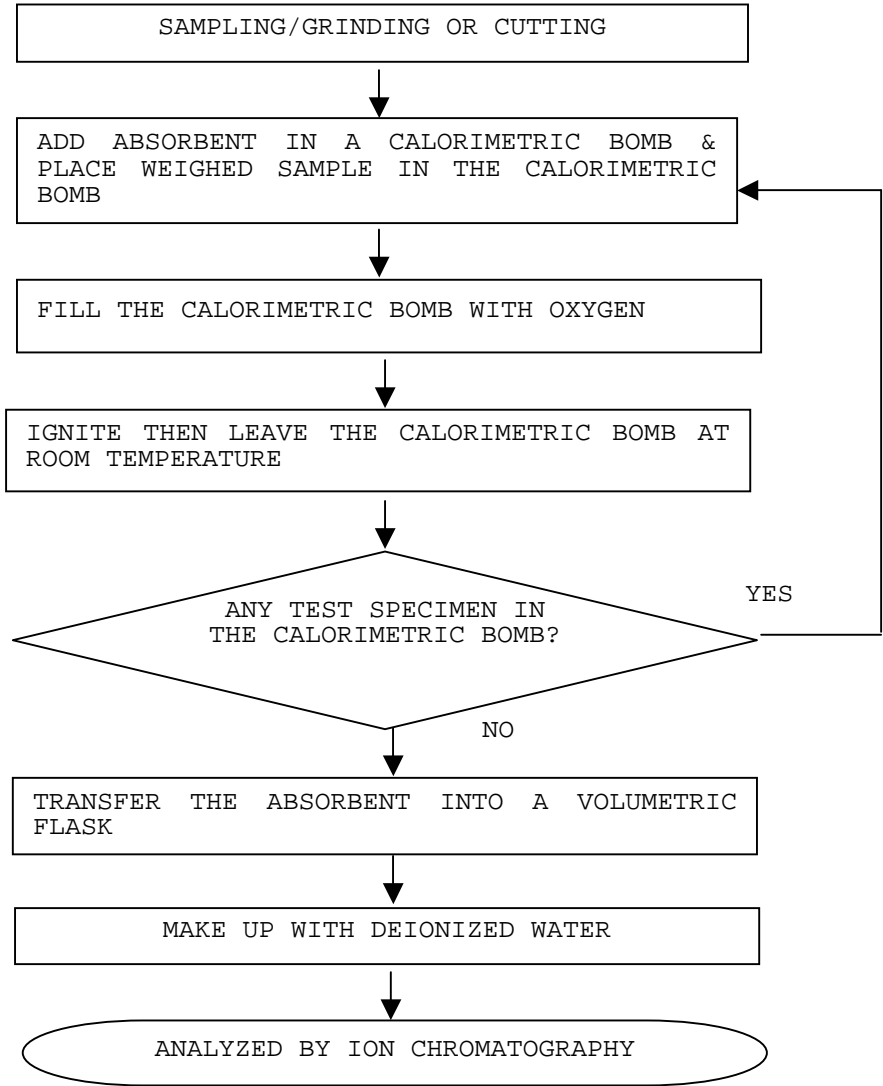
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TESTS CONDUCTED

( III ) MEASUREMENT FLOWCHART :

TEST FOR HALOGEN CONTENT

REFERENCE METHOD: BS EN 14582:2007



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END OF REPORT



**TEST REPORT**

NUMBER: SZHH0048757801

APPLICANT: LITTELFUSE, INC.  
8755 WEST HIGGINS ROAD SUITE 500  
CHICAGO IL 60631 USA

DATE: May 21, 2010

ATTN: KRISTEEN BACILA/ARSENIO CESISTA JR.

SAMPLE DESCRIPTION:

ONE (1) SUBMITTED SAMPLE SAID TO BE **LIGHT GREY PASTE.**

PART DESCRIPTION : TERMINATIONS.  
PART NUMBER : MS208.  
DATE SAMPLE RECEIVED : MAY 17, 2010.  
DATE TEST STARTED : MAY 17, 2010.



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TESTS CONDUCTED:

AS REQUESTED BY THE APPLICANT, FOR DETAILS REFER TO ATTACHED PAGE(S)

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AUTHORIZED BY:  
FOR INTERTEK TESTING SERVICES  
SHENZHEN LTD.



KARBON M.Y. WU  
GENERAL MANAGER



**TEST REPORT**

NUMBER: SZHH0048757801

TESTS CONDUCTED

1 RoHS CHEMICAL TEST

(A) TEST RESULT SUMMARY:

TESTING ITEM	RESULT
CADMIUM (Cd) CONTENT (mg/kg)	ND (<2)
LEAD (Pb) CONTENT (mg/kg)	2070
MERCURY (Hg) CONTENT (mg/kg)	ND (<2)
CHROMIUM (VI)(Cr <sup>6+</sup> ) CONTENT (mg/kg)	ND (<1)
POLYBROMINATED BIPHENYLS (PBBs) (mg/kg)	
MONOBROMOBIPHENYL (MonoBB)	ND (<5)
DIBROMOBIPHENYL (DiBB)	ND (<5)
TRIBROMOBIPHENYL (TriBB)	ND (<5)
TETRABROMOBIPHENYL (TetraBB)	ND (<5)
PENTABROMOBIPHENYL (PentaBB)	ND (<5)
HEXABROMOBIPHENYL (HexaBB)	ND (<5)
HEPTABROMOBIPHENYL (HeptaBB)	ND (<5)
OCTABROMOBIPHENYL (OctaBB)	ND (<5)
NONABROMOBIPHENYL (NonaBB)	ND (<5)
DECABROMOBIPHENYL (DecaBB)	ND (<5)
POLYBROMINATED DIPHENYL ETHERS (PBDEs) (mg/kg)	
MONOBROMODIPHENYL ETHER (MonoBDE)	ND (<5)
DIBROMODIPHENYL ETHER (DiBDE)	ND (<5)
TRIBROMODIPHENYL ETHER (TriBDE)	ND (<5)
TETRABROMODIPHENYL ETHER (TetraBDE)	ND (<5)
PENTABROMODIPHENYL ETHER (PentaBDE)	ND (<5)
HEXABROMODIPHENYL ETHER (HexaBDE)	ND (<5)
HEPTABROMODIPHENYL ETHER (HeptaBDE)	ND (<5)
OCTABROMODIPHENYL ETHER (OctaBDE)	ND (<5)
NONABROMODIPHENYL ETHER (NonaBDE)	ND (<5)
DECABROMODIPHENYL ETHER (DecaBDE)	ND (<5)

CHEMIST: LV LINNA

mg/kg = MILLIGRAM PER KILOGRAM BASED ON DRY WEIGHT OF SAMPLE = ppm

< = LESS THAN

ND = NOT DETECTED

\*\*\*\*\*





**TEST REPORT**

NUMBER: SZHH0048757801

TESTS CONDUCTED

(B) RoHS REQUIREMENT:

RESTRICTED SUBSTANCES	LIMITS
CADMIUM (Cd)	0.01% (100 ppm)
LEAD (Pb)	0.1% (1000 ppm)
MERCURY (Hg)	0.1% (1000 ppm)
CHROMIUM (VI) (Cr <sup>6+</sup> )	0.1% (1000 ppm)
POLYBROMINATED BIPHENYLS (PBBs)	0.1% (1000 ppm)
POLYBROMINATED DIPHENYL ETHERS (PBDEs)	0.1% (1000 ppm)

THE ABOVE LIMITS WERE QUOTED FROM 2002/95/EC AND AMENDMENT 2005/618/EC FOR HOMOGENEOUS MATERIAL.

(C) TEST METHOD:

TESTING ITEM	TESTING METHOD	REPORTING LIMIT
CADMIUM (Cd) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008, BY ACID DIGESTION AND DETERMINED BY ICP - OES	2 mg/kg
LEAD (Pb) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008, BY ACID DIGESTION AND DETERMINED BY ICP - OES	2 mg/kg
MERCURY (Hg) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008, BY ACID DIGESTION AND DETERMINED BY ICP - OES	2 mg/kg
CHROMIUM (VI) (Cr <sup>6+</sup> ) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008, BY ALKALINE DIGESTION AND DETERMINED BY UV-VIS SPECTROPHOTOMETER	1 mg/kg
POLYBROMINATED BIPHENYLS (PBBs) & POLYBROMINATED DIPHENYL ETHERS (PBDEs)	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008, BY SOLVENT EXTRACTION AND DETERMINED BY GC/MS AND FURTHER HPLC CONFIRMATION WHEN NECESSARY	5 mg/kg

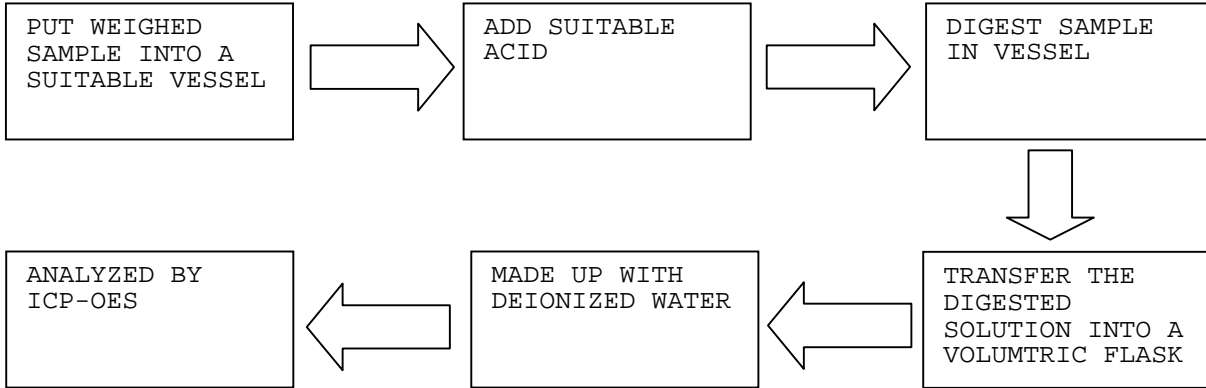
DATE SAMPLE RECEIVED : MAY 17, 2010  
TESTING PERIOD : MAY 17, 2010 TO MAY 20, 2010

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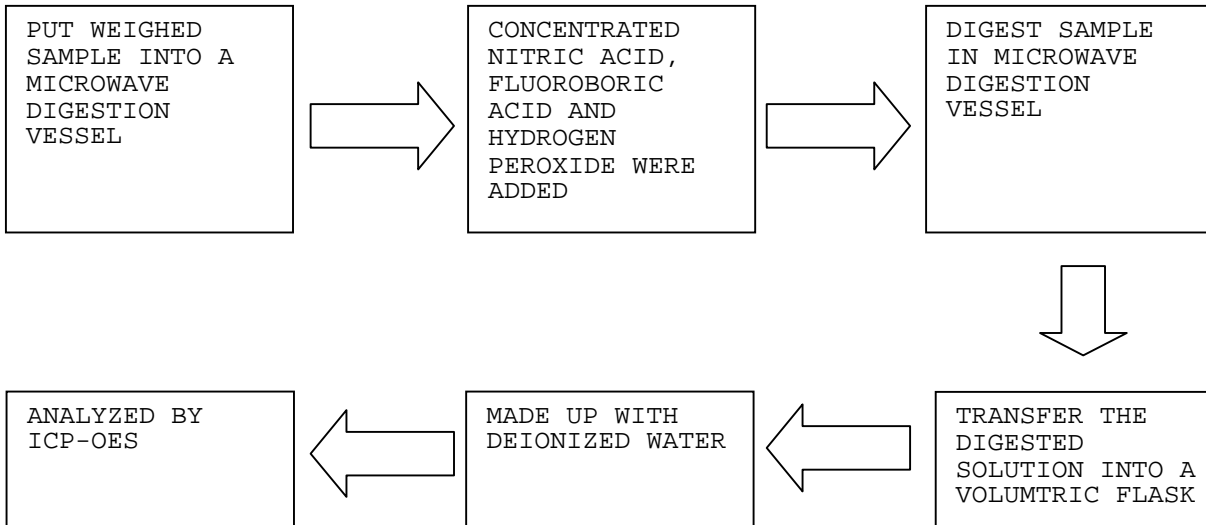
TESTS CONDUCTED

(D) MEASUREMENT FLOWCHART:

1. TEST FOR Cd/Pb CONTENTS



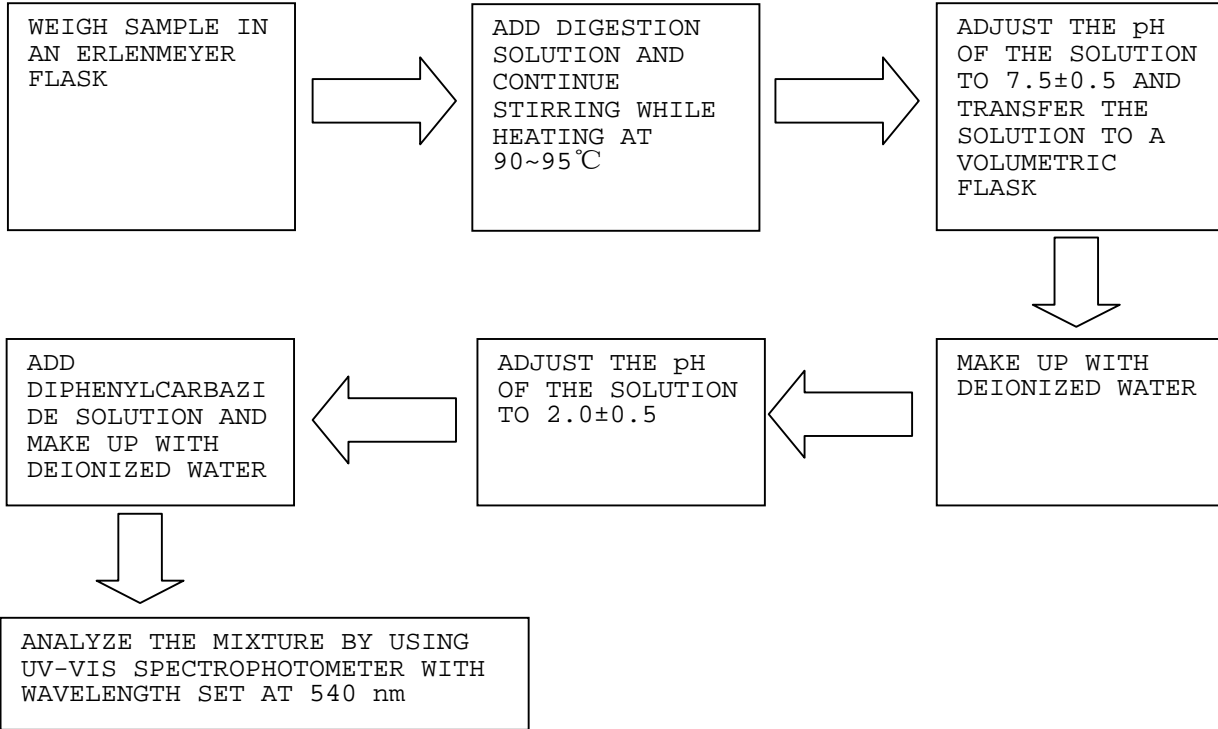
2. TEST FOR Hg CONTENT



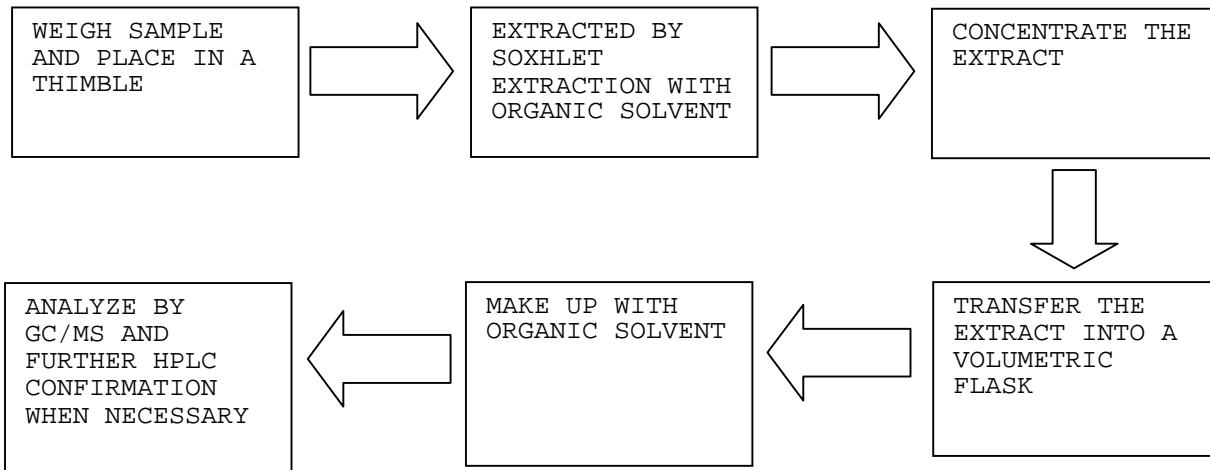
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TESTS CONDUCTED

3. TEST FOR CHROMIUM (VI) (Cr<sup>6+</sup>) CONTENT (ALKALINE DIGESTION)



4. TEST FOR PBBs/PBDEs CONTENTS



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**TEST REPORT**

NUMBER: SZHH0048757801

TESTS CONDUCTED

2 ( I ) TEST RESULT SUMMARY :

HALOGEN CONTENT :

<u>TESTING ITEM</u>	<u>RESULT (ppm)</u>
FLUORINE (F) CONTENT	ND
CHLORINE (Cl) CONTENT	ND
BROMINE (Br) CONTENT	ND
IODINE (I) CONTENT	ND

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

( II ) TEST METHOD :

<u>TESTING ITEM</u>	<u>TESTING METHOD</u>	<u>REPORTING LIMIT</u>
HALOGEN (F, Cl, Br, I) CONTENT	WITH REFERENCE TO BS EN 14582:2007 BY CALORIMETRIC BOMB AND DETERMINED BY ION CHROMATOGRAPHY	50 ppm

REMARK : REPORTING LIMIT = QUANTITATION LIMIT OF ANALYTE IN SAMPLE

DATE SAMPLE RECEIVED : MAY 17, 2010  
 TESTING PERIOD : MAY 17, 2010 TO MAY 20, 2010

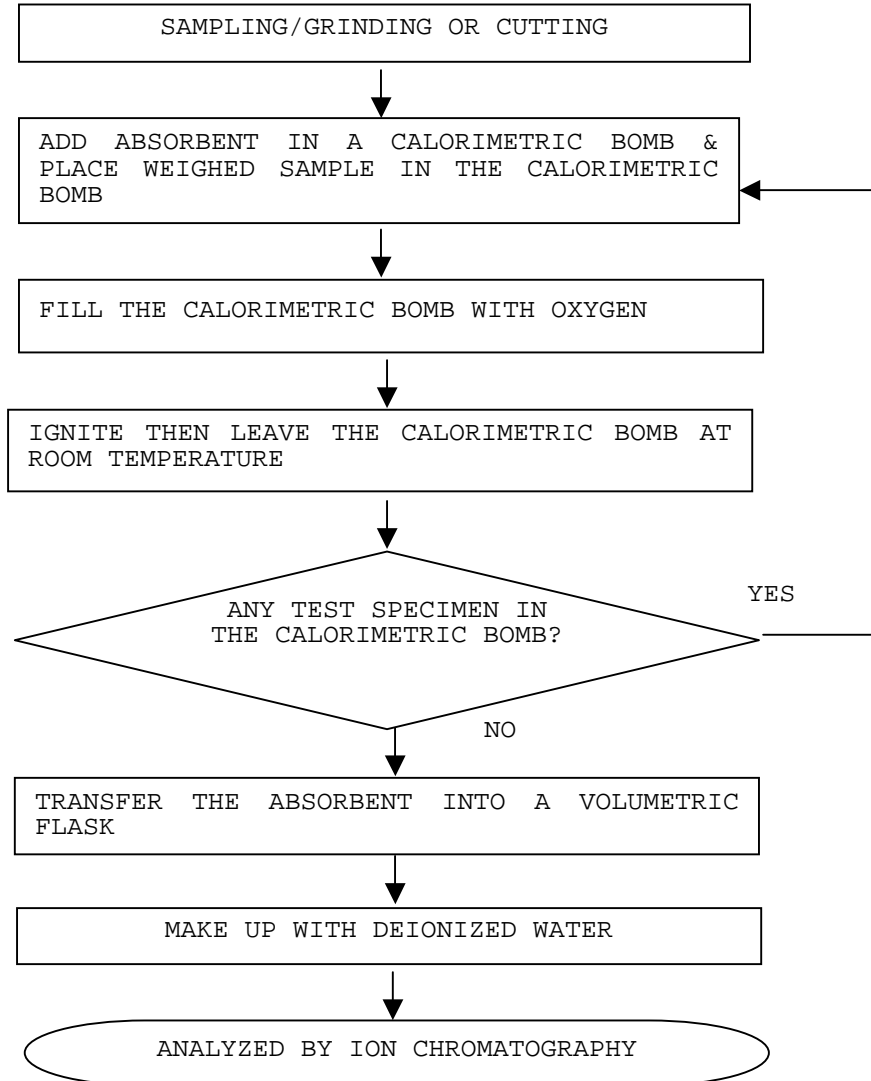
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TESTS CONDUCTED

( III ) MEASUREMENT FLOWCHART:

TEST FOR HALOGEN CONTENT

REFERENCE METHOD: BS EN 14582:2007



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END OF REPORT



**TEST REPORT**

NUMBER: SZHH0048756801

APPLICANT: LITTELFUSE, INC  
8755 WEST HIGGINS ROAD SUITE 500  
CHICAGO IL 60631 USA

DATE: May 20, 2010

ATTN: KRISTEEN BACILA/ARSENIO CESISTA JR.

**SAMPLE DESCRIPTION:**

ONE (1) SUBMITTED SAMPLE SAID TO BE **SILVER-GREY METAL**.  
PART DESCRIPTION : NICKEL PLATED.  
DATE SAMPLE RECEIVED : MAY 17, 2010.  
DATE TEST STARTED : MAY 17, 2010.



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**TESTS CONDUCTED:**

AS REQUESTED BY THE APPLICANT, FOR DETAILS REFER TO ATTACHED PAGE(S)

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AUTHORIZED BY:  
FOR INTERTEK TESTING SERVICES  
SHENZHEN LTD.



KARBON M.Y. WU  
GENERAL MANAGER



**TEST REPORT**

NUMBER: SZHH0048756801

TESTS CONDUCTED

RoHS CHEMICAL TEST

(A) TEST RESULT SUMMARY:

TESTING ITEM	RESULT
CADMIUM (Cd) CONTENT (mg/kg)	ND(<2)
LEAD (Pb) CONTENT (mg/kg)	ND(<2)
MERCURY (Hg) CONTENT (mg/kg)	ND(<2)
CHROMIUM (VI)(Cr <sup>6+</sup> ) RESULT (BY BOILING WATER EXTRACTION ON METAL)(mg/kg WITH 50cm <sup>2</sup> )	NEGATIVE (<0.02)

CHEMIST: LV LINNA

mg/kg = MILLIGRAM PER KILOGRAM = ppm  
mg/kg WITH 50cm<sup>2</sup> = MILLIGRAM PER KILOGRAM WITH 50 SQUARE CENTIMETRE  
< = LESS THAN  
ND = NOT DETECTED

POSITIVE = A POSITIVE TEST RESULT INDICATED THE PRESENCE OF Cr(VI) AT THE TIME OF TESTING, EQUAL TO OR GREATER THAN THRESHOLD OF 1 mg/kg FOR SPOT TEST PROCEDURE OR 0.02 mg/kg FOR BOILING-WATER-EXTRACTION PROCEDURES WITH A SAMPLE SURFACE AREA OF 50cm<sup>2</sup> USED. HOWEVER, IT SHALL NOT BE INTERPRETED AS THE Cr(VI) CONCENTRATION IN THE COATING LAYER OF THE SAMPLE AND SHOULD NOT BE USED AS A METHOD DETECTION LIMIT FOR THIS QUALITATIVE TEST.

NEGATIVE = A NEGATIVE TEST RESULT INDICATED ABOVE POSITIVE OBSERVATION WAS NOT FOUND AT THE TIME OF TESTING. WHEN THE SPOT-TEST SHOWED A NEGATIVE RESULT, THE BOILING-WATER-EXTRACTION PROCEDURE SHALL BE USED TO VERIFY THE RESULT.

(B) RoHS REQUIREMENT:

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

THE ABOVE LIMITS WERE QUOTED FROM 2002/95/EC AND AMENDMENT 2005/618/EC FOR HOMOGENEOUS MATERIAL.

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**TEST REPORT**

NUMBER: SZHH0048756801

TESTS CONDUCTED

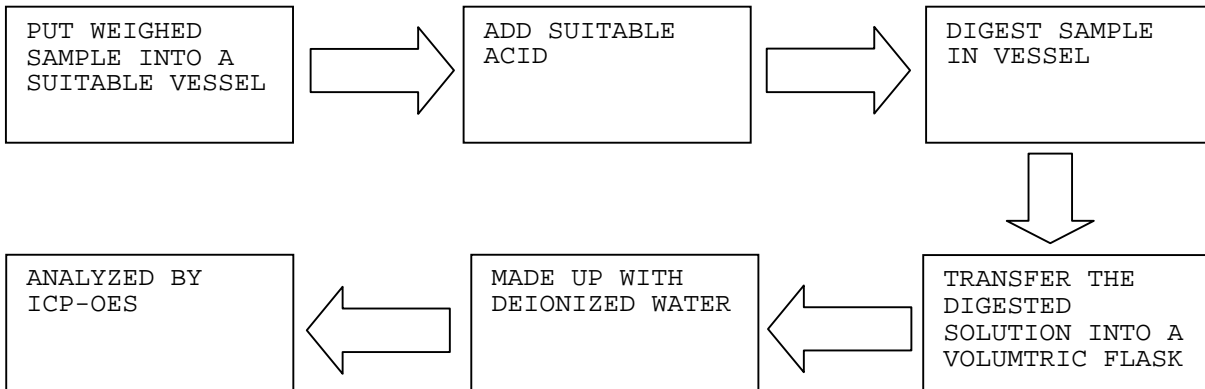
(C) TEST METHOD:

TESTING ITEM	TESTING METHOD	REPORTING LIMIT
CADMIUM (Cd) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008, BY ACID DIGESTION AND DETERMINED BY ICP - OES	2 mg/kg
LEAD (Pb) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008, BY ACID DIGESTION AND DETERMINED BY ICP - OES	2 mg/kg
MERCURY (Hg) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008, BY ACID DIGESTION AND DETERMINED BY ICP - OES	2 mg/kg
CHROMIUM (VI) (Cr <sup>6+</sup> ) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008, BY BOILING WATER EXTRACTION AND DETERMINED BY UV-VIS SPECTROPHOTOMETER	POSITIVE/NEGATIVE (THRESHOLD OF 0.02mg/kg with 50cm <sup>2</sup> )

DATE SAMPLE RECEIVED: MAY 17, 2010  
TESTING PERIOD: MAY 17, 2010 TO MAY 19, 2010

(D) MEASUREMENT FLOWCHART:

1. TEST FOR Cd/Pb CONTENTS

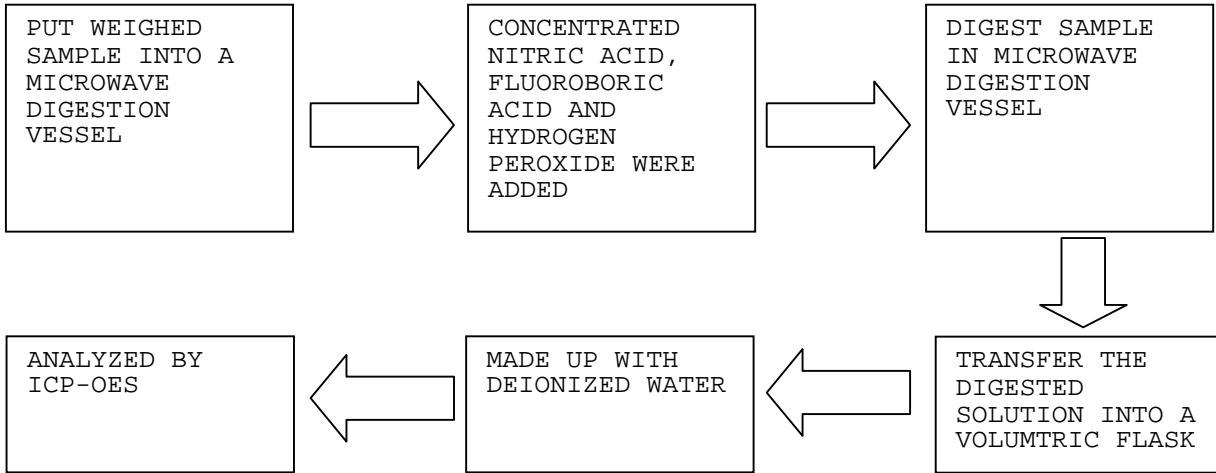


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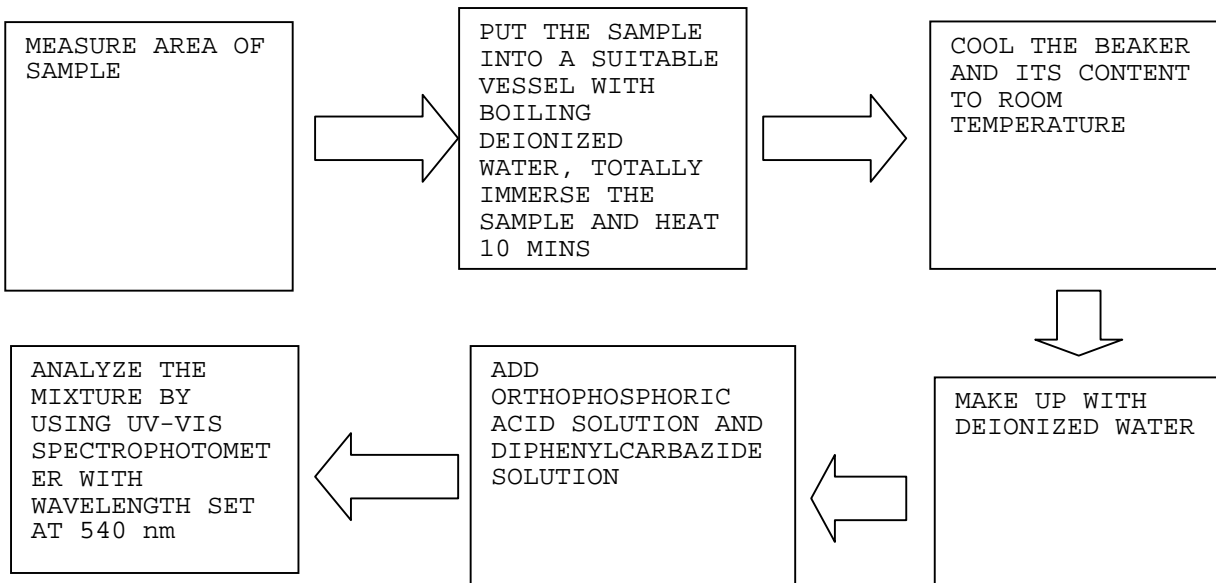


TESTS CONDUCTED

2. TEST FOR Hg CONTENT



3. TEST FOR CHROMIUM(VI) (Cr<sup>6+</sup>) CONTENT (BOILING WATER EXTRACTION)



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END OF REPORT



**TEST REPORT**

NUMBER: SZHH0048756802

APPLICANT: LITTELFUSE, INC.  
8755 WEST HIGGINS ROAD SUITE 500  
CHICAGO IL 60631 USA

DATE: May 20, 2010

ATTN: KRISTEEN BACILA/ARSENIO CESISTA JR.

**SAMPLE DESCRIPTION:**

ONE (1) SUBMITTED SAMPLE SAID TO BE **SILVER-GREY METAL**.  
PART DESCRIPTION : TIN PLATED.  
DATE SAMPLE RECEIVED : MAY 17, 2010.  
DATE TEST STARTED : MAY 17, 2010.



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**TESTS CONDUCTED:**

AS REQUESTED BY THE APPLICANT, FOR DETAILS REFER TO ATTACHED PAGE(S)

\*\*\*\*\*

AUTHORIZED BY:  
FOR INTERTEK TESTING SERVICES  
SHENZHEN LTD.



KARBON M.Y. WU  
GENERAL MANAGER



**TEST REPORT**

NUMBER: SZHH0048756802

TESTS CONDUCTED

RoHS CHEMICAL TEST

(A) TEST RESULT SUMMARY:

TESTING ITEM	RESULT
CADMIUM (Cd) CONTENT (mg/kg)	ND(<2)
LEAD (Pb) CONTENT (mg/kg)	321
MERCURY (Hg) CONTENT (mg/kg)	ND(<2)
CHROMIUM (VI)(Cr <sup>6+</sup> ) RESULT (BY BOILING WATER EXTRACTION ON METAL)(mg/kg WITH 50cm <sup>2</sup> )	NEGATIVE (<0.02)

CHEMIST: LV LINNA

mg/kg = MILLIGRAM PER KILOGRAM = ppm  
mg/kg WITH 50cm<sup>2</sup> = MILLIGRAM PER KILOGRAM WITH 50 SQUARE CENTIMETRE  
< = LESS THAN  
ND = NOT DETECTED

POSITIVE = A POSITIVE TEST RESULT INDICATED THE PRESENCE OF Cr(VI) AT THE TIME OF TESTING, EQUAL TO OR GREATER THAN THRESHOLD OF 1 mg/kg FOR SPOT TEST PROCEDURE OR 0.02 mg/kg FOR BOILING-WATER-EXTRACTION PROCEDURES WITH A SAMPLE SURFACE AREA OF 50cm<sup>2</sup> USED. HOWEVER, IT SHALL NOT BE INTERPRETED AS THE Cr(VI) CONCENTRATION IN THE COATING LAYER OF THE SAMPLE AND SHOULD NOT BE USED AS A METHOD DETECTION LIMIT FOR THIS QUALITATIVE TEST.

NEGATIVE = A NEGATIVE TEST RESULT INDICATED ABOVE POSITIVE OBSERVATION WAS NOT FOUND AT THE TIME OF TESTING. WHEN THE SPOT-TEST SHOWED A NEGATIVE RESULT, THE BOILING-WATER-EXTRACTION PROCEDURE SHALL BE USED TO VERIFY THE RESULT.

(B) RoHS REQUIREMENT:

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

THE ABOVE LIMITS WERE QUOTED FROM 2002/95/EC AND AMENDMENT 2005/618/EC FOR HOMOGENEOUS MATERIAL.

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**TEST REPORT**

NUMBER: SZHH0048756802

TESTS CONDUCTED

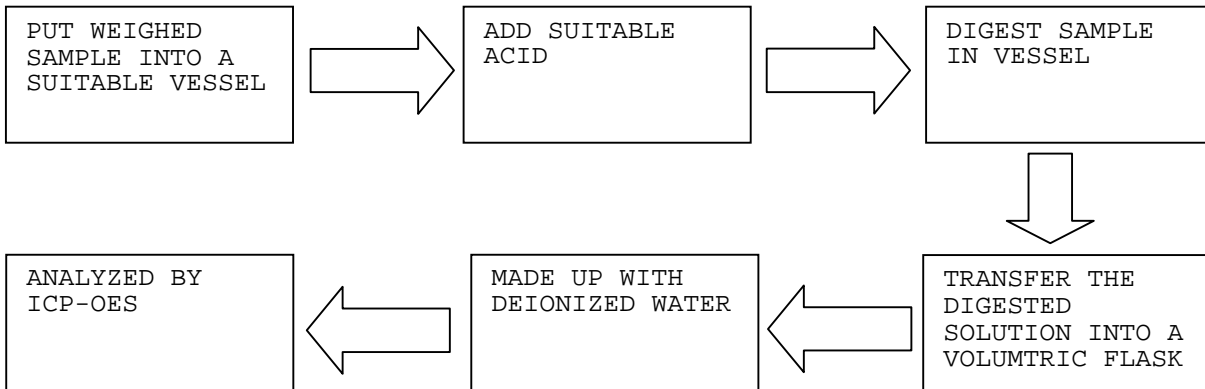
(C) TEST METHOD:

TESTING ITEM	TESTING METHOD	REPORTING LIMIT
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LEAD (Pb) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008, BY ACID DIGESTION AND DETERMINED BY ICP - OES	2 mg/kg
MERCURY (Hg) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008, BY ACID DIGESTION AND DETERMINED BY ICP - OES	2 mg/kg
CHROMIUM (VI) (Cr <sup>6+</sup> ) CONTENT	WITH REFERENCE TO IEC 62321 EDITION 1.0:2008, BY BOILING WATER EXTRACTION AND DETERMINED BY UV-VIS SPECTROPHOTOMETER	POSITIVE/NEGATIVE (THRESHOLD OF 0.02mg/kg with 50cm <sup>2</sup> )

DATE SAMPLE RECEIVED: MAY 17, 2010  
TESTING PERIOD: MAY 17, 2010 TO MAY 19, 2010

(D) MEASUREMENT FLOWCHART:

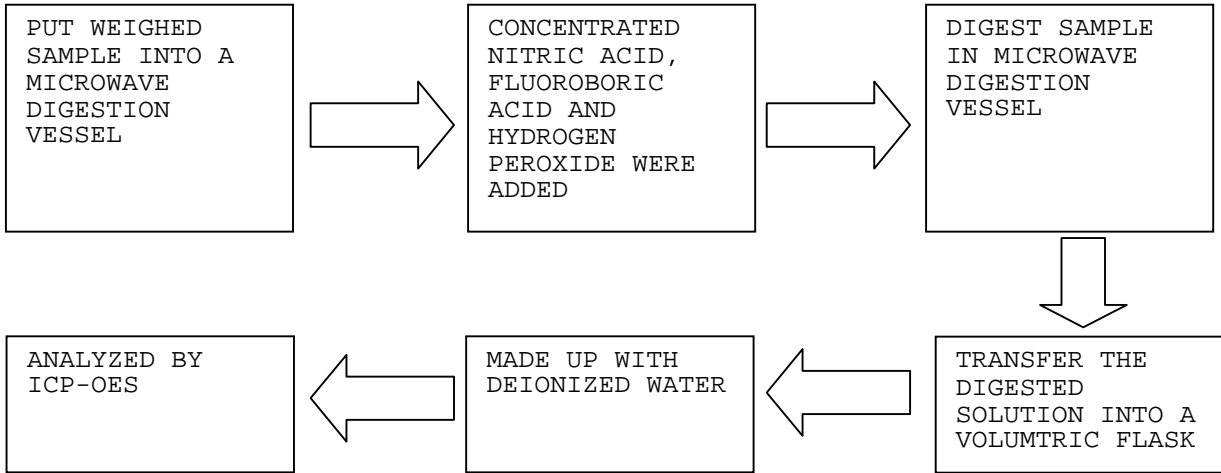
1. TEST FOR Cd/Pb CONTENTS



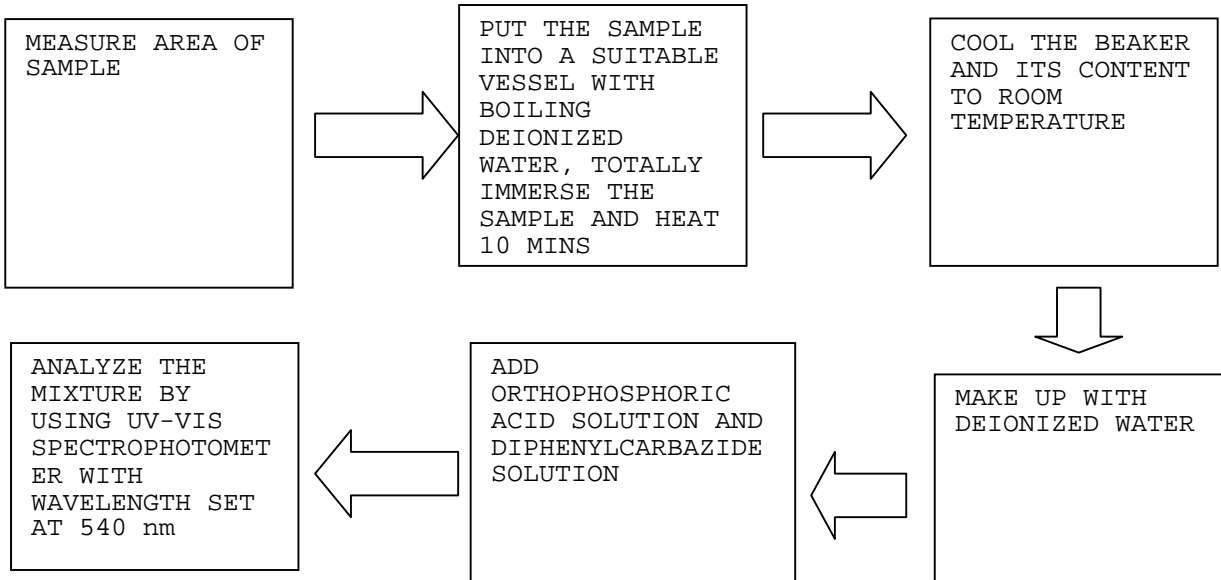
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TESTS CONDUCTED

2. TEST FOR Hg CONTENT



3. TEST FOR CHROMIUM(VI) (Cr<sup>6+</sup>) CONTENT (BOILING WATER EXTRACTION)



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END OF REPORT