Test Report Number: SHAH00627927

Applicant: RAYCHEM ELECTRONICS (SHANGHAI) LTD.
NO.307 QIN JIANG ROAD SHANGHAI P.R CHINA
Attn: SHEN YUE DONG

Date: 14 Dec, 2015

Sample Description:

One (1) group of submitted sample said to be **Black plastic tube**

Item Name : V4-9.0-0-FSP-SM

Lot No. : 201754786

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Tests Conducted:

As requested by the applicant, for details refer to attached page(s).

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To be continued

Authorized By:
For Intertek Testing Services Ltd., Shanghai

Leo Shi
General Manager

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Conclusion:

Tested Sample	Standard	Result
Tested component of submitted sample	Restriction of the use of certain hazardous substance in electrical and electronic equipment (RoHS Directive 2011/65/EU)	Pass
Tested component of submitted sample	Halogen (F, Cl, Br, I) content	See Test Conducted
	TBBPA & TBBPA-bis(2,3-dibromopropyl ether) content	See Test Conducted
Tested component of submitted sample	Dimethylfumarate Content Requirement In Annex XVII Item 61 Of The REACH Regulation (EC) NO. 1907/2006 & Amendment (EU) No. 412/2012	Pass
Tested component of submitted sample	Chlorinated paraffin (C10 - C13) content	See Test Conducted
	Phthalates content requirement in Annex XVII items 51 & 52 of the REACH regulation (EC) NO. 1907/2006 & Amendment NO.552/2009	Pass
	BS EN 71-3:2013+A1:2014 for migration of certain elements	Pass
Tested components of submitted sample	Formaldehyde Content	See Test Conducted
Tested component of submitted sample	PFOS and PFOA content	See Test Conducted
	NP/OP/NPEO/OPEO content	See Test Conducted
	Organotin content requirement in Annex XVII item 20 of the Reach regulation (EC) No.1907/2006 & amendent (EU) No.276/2010	Pass
	Asbestos qualitative test	See Test Conducted
	Qualitative test for Polyvinyl Chloride(PVC)	See Test Conducted
	Regulation (EC) No.1005/2009 Amending Regulation (EC) No.744/2010 on Ozone Depleting Substance (ODS) content	See Test Conducted
Tested components of submitted sample	Formaldehyde Content	See Test Conducted

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To be continued

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Tests Conducted

1 (A) Test result of RoHS Directive：

Testing Item	**Result**
	(1)
Cadmium (Cd) content (mg/kg)	ND
Lead (Pb) content (mg/kg)	ND
Mercury (Hg) content (mg/kg)	ND
Chromium (VI) (Cr^{6+}) content (mg/kg) (for non-metal)	ND
Polybrominated biphenyls (PBBs) (mg/kg)	
monobromo biphenyls (MonoBB)	ND
Dibromo biphenyls (DiBB)	ND
Tribromo biphenyls (TriBB)	ND
Tetrabromo biphenyls (TetraBB)	ND
Pentabromo biphenyls (PentaBB)	ND
Hexabromo biphenyls (HexaBB)	ND
Heptabromo biphenyls (HeptaBB)	ND
Octabromo biphenyls (OctaBB)	ND
Nonabromo biphenyls (NonaBB)	ND
Decabromo biphenyl (DecaBB)	ND
Polybrominated diphenyl ethers (PBDEs) (mg/kg)	
Monobromo diphenyl ethers (MonoBDE)	ND
Dibromo diphenyl ethers (DiBDE)	ND
Tribromo diphenyl ethers (TriBDE)	ND
Tetrabromo diphenyl ethers (TetraBDE)	ND
Pentabromo diphenyl ethers (PentaBDE)	ND
Hexabromo diphenyl ethers (HexaBDE)	ND
Heptabromo diphenyl ethers (HeptaBDE)	ND
Octabromo diphenyl ethers (OctaBDE)	ND
Nonabromo diphenyl ethers (NonaBDE)	ND
Decabromo diphenyl ether (DecaBDE)	ND
Phthalates(mg/kg)	**(1)**
Bis(2-ethylhexyl)phthalate(DEHP)	ND
Butyl benzyl phthalate(BBP)	ND
Dibutyl phthalate(DBP)	ND
Diisobutyl phthalate(DIBP)	ND

Remark：ND = Not Detected

Tested Component：See component list in the last section of this report.

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To be continued

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Tests Conducted

(B) RoHS Requirement：

Restricted Substances	**Limits**
Cadmium (Cd)	0.01% (100 mg/kg)
Lead (Pb)	0.1% (1000 mg/kg)
Mercury (Hg)	0.1% (1000 mg/kg)
Chromium (VI) (Cr^{6+})	0.1% (1000 mg/kg)
Polybrominated biphenyls (PBBs)	0.1% (1000 mg/kg)
Polybrominated diphenyl ethers (PBDEs)	0.1% (1000 mg/kg)

The above limits were quoted from RoHS Directive 2011/65/EU for homogeneous material.

(C) Test method：

Testing Item	**Testing Method**	**Reporting Limit**
Cadmium (Cd) content	With reference to IEC 62321-5 Edition 1.0：2013, by acid digestion until the tested sample was totally dissolved, and determined by ICP-OES.	2 mg/kg
Lead (Pb) content	With reference to IEC 62321-5 Edition 1.0：2013, by acid digestion until the tested sample was totally dissolved, and determined by ICP-OES.	2 mg/kg
Mercury (Hg) content	With reference to IEC 62321-4 Edition 1.0：2013, by acid digestion until the tested sample was totally dissolved, and determined by ICP-OES.	2 mg/kg
Chromium (VI) (Cr^{6+}) content (for non-metal)	With reference to IEC 62321 Edition 1.0：2008, by alkaline digestion and determined by UV-VIS Spectrophotometer.	1mg/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： Dec.2, 2015

Testing Period： Dec.2, 2015 To Dec.7, 2015

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To be continued

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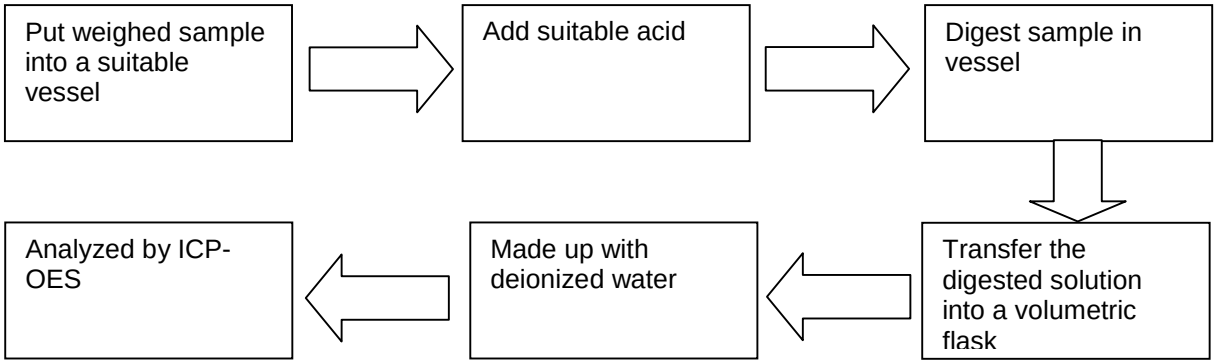
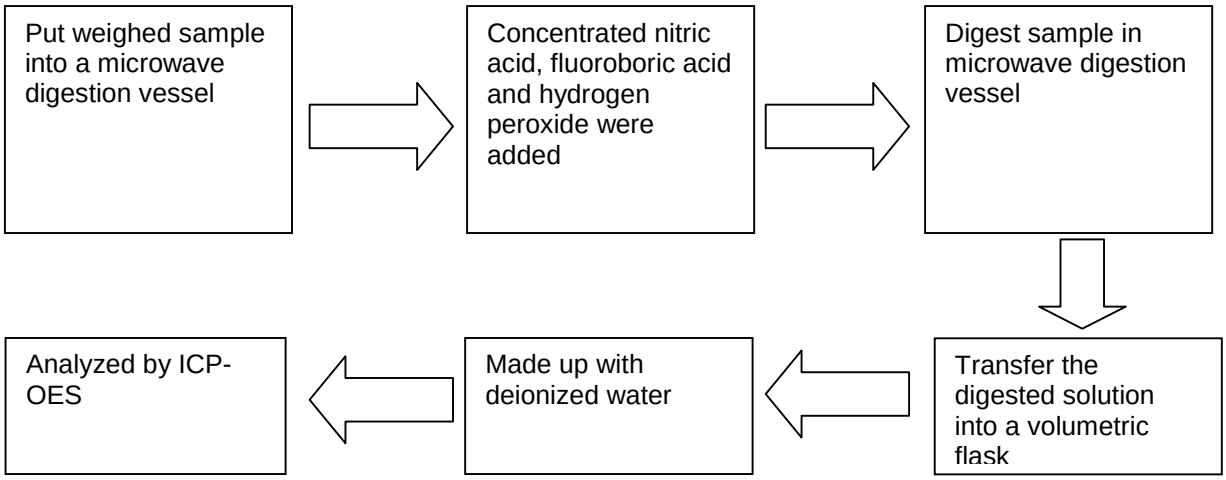
Tests Conducted

(D) Measurement flowchart：

1. Test for Cd/Pb Contents



2. Test for Hg Content



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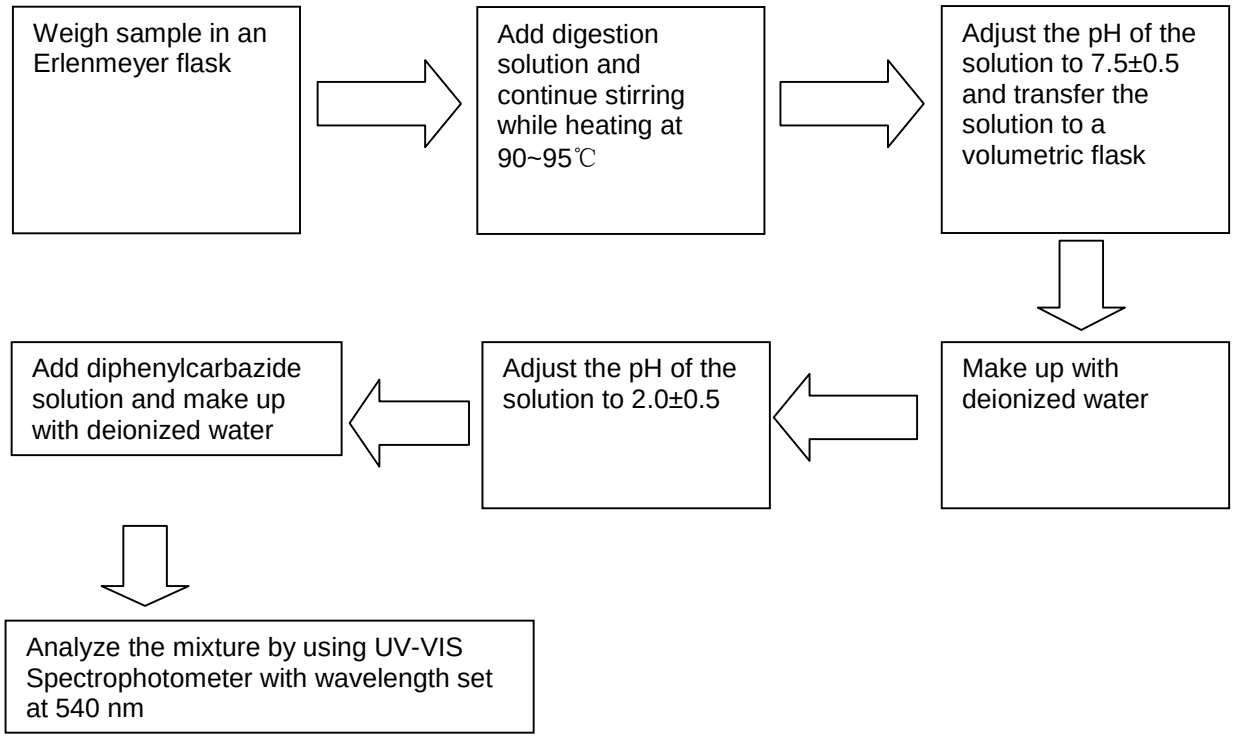
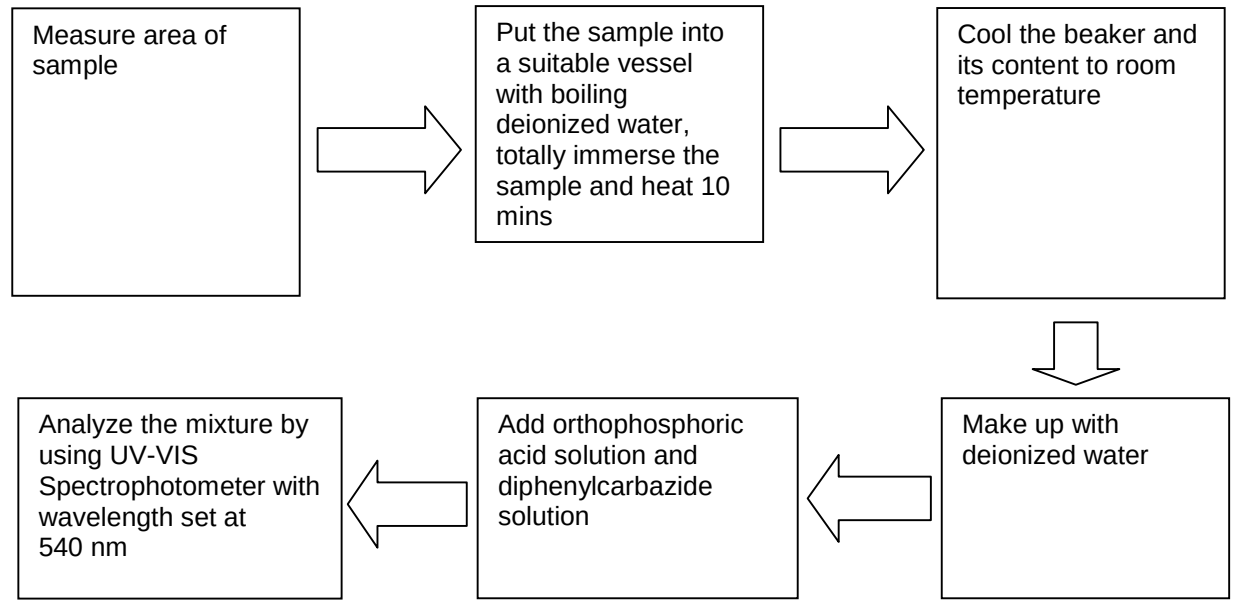
Tests Conducted

3. Test for Chromium (VI) (Cr^{6+}) Content (Alkaline Digestion)



4. Test for Chromium (VI) (Cr^{6+}) Content (Boiling Water Extraction)



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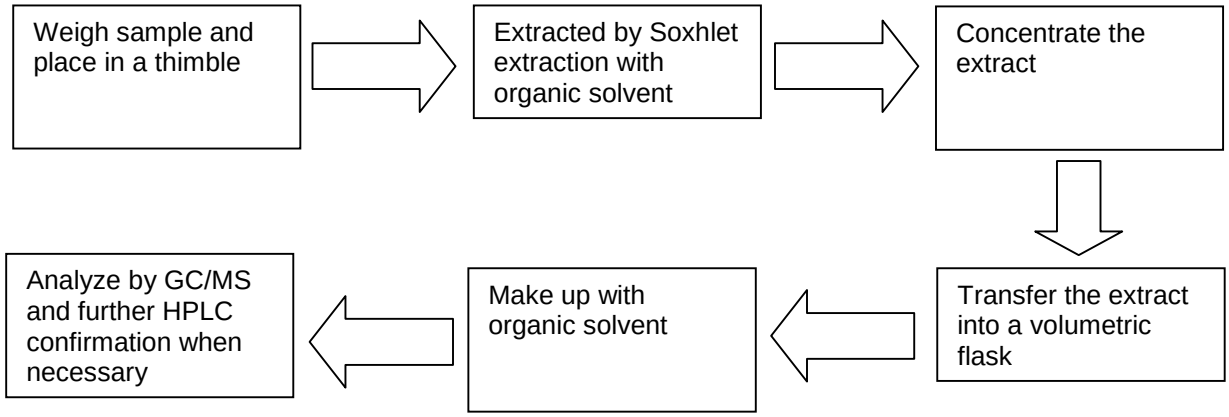
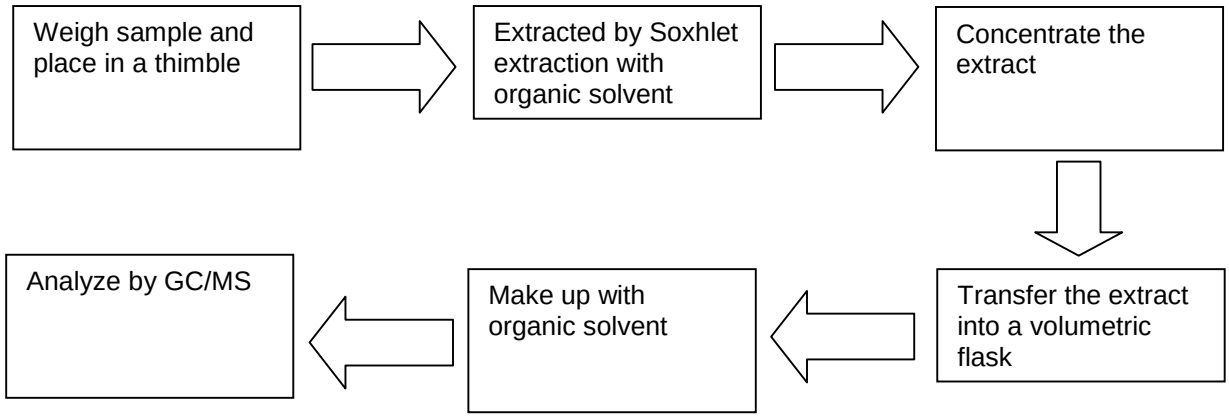
Tests Conducted

5. Test for PBBs/PBDEs Contents



6. Test for Phthalate Contents



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Tests Conducted

2 Detection Of Amines Derived From Azocolourants and Azodyes：

By Gas Chromatographic - Mass Spectrometric (GC-MS) and High Performance Liquid Chromatographic (HPLC) analysis.

Test Method： EN 14362-1：2012 for Textile Material
EN ISO 17234-1：2010 for Leather Material
EN 14362-3： 2012 & EN ISO 17234-2：2011 for p-Aminoazobenzene

	Forbidden	Cas No.	Result (1)
1.	4-Aminodiphenyl	92-67-1	ND
2.	Benzidine	92-87-5	ND
3.	4-Chloro-o-Toluidine	95-69-2	ND
4.	2-Naphthylamine	91-59-8	ND
5.	o-Aminoazotoluene	97-56-3	ND
6.	2-Amino-4-Nitrotoluene	99-55-8	ND
7.	p-Chloroaniline	106-47-8	ND
8.	2,4-Diaminoanisole	615-05-4	ND
9.	4,4'-Diaminodiphenylmethane	101-77-9	ND
10.	3,3'-Dichlorobenzidine	91-94-1	ND
11.	3,3'-Dimethoxybenzidine	119-90-4	ND
12.	3,3'-Dimethylbenzidine	119-93-7	ND
13.	3,3'-Dimethyl-4,4'diaminodiphenylmethane	838-88-0	ND
14.	p-Cresidine	120-71-8	ND
15.	4,4'-Methylene-Bis(2-Chloroaniline)	101-14-4	ND
16.	4,4'-Oxydianiline	101-80-4	ND
17.	4,4'-Thiodianiline	139-65-1	ND
18.	o-Toluidine	95-53-4	ND
19.	2,4-Toluylenediamine	95-80-7	ND
20.	2,4,5-Trimethylaniline	137-17-7	ND
21.	o-Anisidine	90-04-0	ND
22.	p-Aminoazobenzene	60-09-3	ND
23.	2,4-Xylidine	95-68-1	ND
24.	2,6-Xylidine	87-62-7	ND

Remark：ND = Not Detected
Detection Limit = 5 ppm
Requirement = Not Used (Less than 20ppm)
ppm = Parts per million = mg/kg

Tested Components：See component list in the last section of this report.

Date Sample Received： Dec.2, 2015
Testing Period： Dec.2, 2015 To Dec.5, 2015

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To be continued

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Tests Conducted

3 Halogen Test

Ⅰ. Test result summary

Halogen content：

Testing Item	Result (ppm)
Fluorine (F) content	ND
Chlorine (Cl) content	ND
Bromine (Br) content	>100000
Iodine (I) content	ND

Remark：ppm = Parts per million = mg/kg
ND = Not Detected

Ⅱ. Test method

Testing Item	Testing Method	Reporting Limit
Halogen (F, Cl, Br, I) content	With reference to EN 14582:2007 by combustion in a calorimetric bomb and determined by ion chromatography	50 ppm

Remarks：Reporting limit = Quantitation limit of analyte in sample

Date Sample Received： Dec.2, 2015
Testing Period： Dec.2, 2015 To Dec.5, 2015

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To be continued

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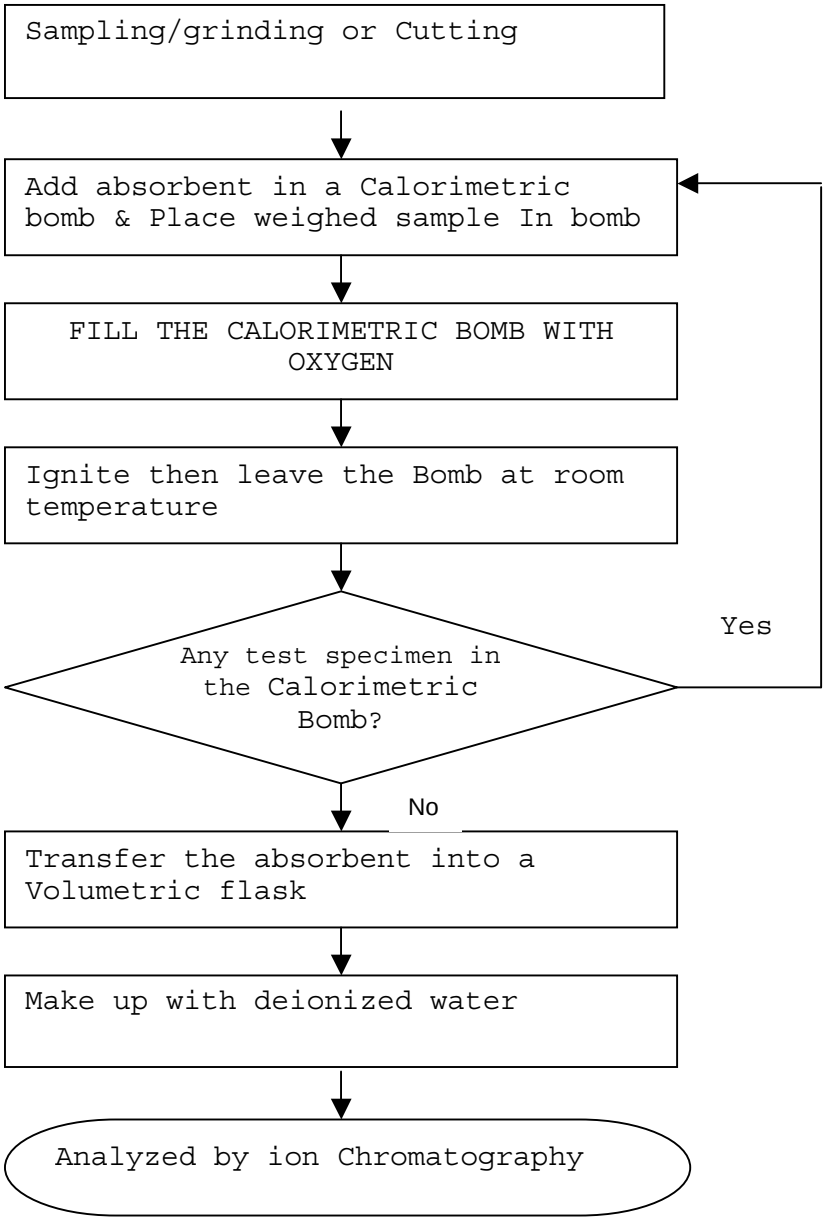
Tests Conducted

4 (III) Measurement flowchart：

Test for Halogen content

Reference method： EN 14582：2007



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Tests Conducted

5 TBBPA-bis and TBBPA

(Ⅰ) Test result summary：

Testing Item	Result (ppm)
	(1)
TBBPA-bis(2,3-dibromopropyl ether) (Tetrabromobisphenol A –bis (2,3-dibromopropyl ether))	ND
TBBPA (Tetrabromobisphenol A)	ND

Remarks：ppm = Parts per million = mg/kg
ND = Not Detected

(Ⅱ) Test method：

Testing Item	Testing Method	Reporting Limit
TBBPA-bis(2,3-dibromopropyl ether) (Tetrabromobisphenol A –bis(2,3-dibromopropyl ether))	With reference to US EPA 3540C, by solvent extraction and determined by HPLC	10 ppm
TBBPA (Tetrabromobisphenol A)	With reference to USEPA 3540C, by solvent extraction and determined by GC/MS	10 ppm

Tested Components：See component list in the last section of this report.

Date Sample Received： Dec.2, 2015
Testing Period： Dec.2, 2015 To Dec.7, 2015

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To be continued

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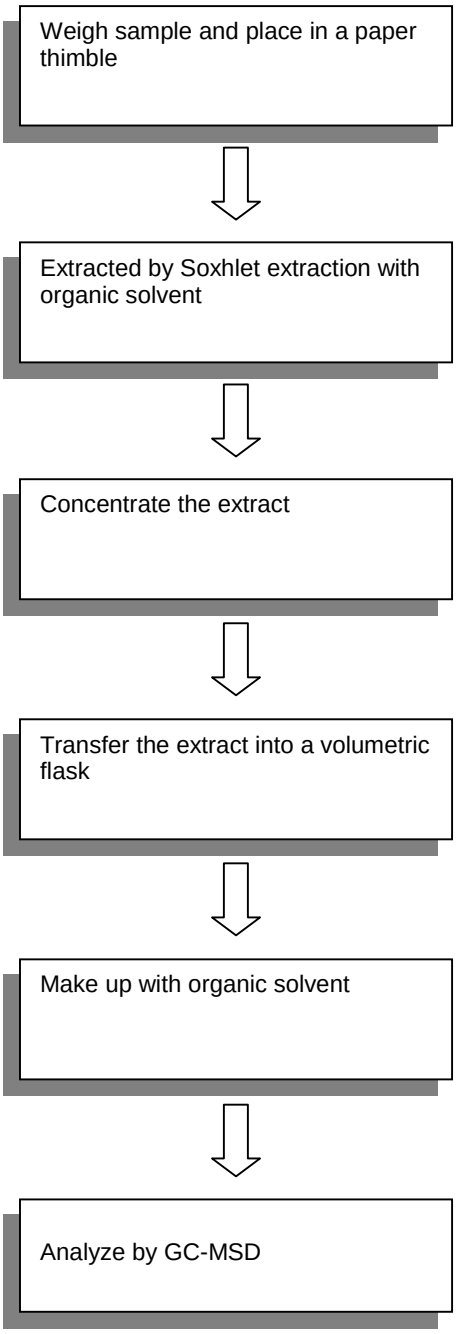
Tests Conducted

6 Measurement flowchart

Test for **TBBPA** content:



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Tests Conducted

7 Dimethyl Fumarate Content

By Solvent Extraction And Gas Chromatographic-Mass Spectrometric (GC-MS) Analysis.

Tested Component	Result (ppm)	Requirement (ppm)
(1)	<0.05	0.1

Remark：Detection Limit = 0.05ppm
ppm = parts per million = mg/kg

Tested Components：See component list in the last section of this report.

Date Sample Received： Dec.2, 2015
Testing Period： Dec.2, 2015 To Dec.7, 2015

8 Chlorinated Paraffin (C10 - C13)

By solvent extraction and Gas Chromatography analysis using Mass Spectrometry or Electron Capture Detector.

Tested Component	Result (%, w/w)
(1)	ND

Remark：Detection Limit = 0.01%(w/w)
ND = Not Detected

Tested Components：See component list in the last section of this report.

Date Sample Received： Dec.2, 2015
Testing Period： Dec.2, 2015 To Dec.7, 2015

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To be continued

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Tests Conducted

9 Detection of Polycyclic Aromatic Hydrocarbons (PAHs)

As per the document ZEK 01.4-08 issued by the central experience exchange office (ZEK), by solvent extraction and determined by GC-MSD.

Compound	Result (ppm)	Requirement (ppm)
Naphthalene	0.4	--
Acenaphthylene	ND	--
Acenaphthene	ND	--
Fluorene	ND	--
Phenanthrene	ND	--
Anthracene	ND	--
Fluoranthene	ND	--
Pyrene	1.1	--
Chrysene	ND	--
Benzo[a]anthracene	ND	--
Benzo[b]fluoranthene	ND	--
Benzo[k]fluoranthene	ND	--
Benzo[a**]pyrene**	ND	1 (max.)
Dibenzo[a,h]anthracene	ND	--
Indeno[1,2,3-cd]pyrene	ND	--
Benzo[g,h,i]perylene	0.4	--
Benzo[j]fluoranthene	ND	
Benzo[e]pyrene	ND	
Sum:	1.9	10 (max.)

Remark：ND = Not Detected
ppm = Parts per million = mg/kg
Detection Limit = 0.2 ppm

Tested Components：See component list in the last section of this report.

Date Sample Received： Dec.2, 2015
Testing Period： Dec.2, 2015 To Dec.7, 2015

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To be continued

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Tests Conducted

10 Phthalate content test

With reference to EN 14372, by Gas Chromatography-Mass Spectrometry (GC-MS) analysis.

Tested compound	Result (%,w/w)	Limit(%,w/w) (MAX.)
	(1)	
Di-butyl phthalate (DBP)	ND	---
Di(2-ethyl hexyl) phthalate(DEHP)	ND	---
Benzyl butyl phthalate (BBP)	ND	---
Sum of three phthalates	ND	0.1
Di-iso-nonyl phthalate (DINP)	ND	---
Di-n-octyl phthalate (DNOP)	ND	---
Di-iso-decyl phthalate (DIDP)	ND	---
Sum of three phthalates	ND	0.1

Remark：The above limit was quoted according to Annex XVII items 51 & 52 of the REACH regulation (EC) NO.1907/2006 & Amendment NO.552/2009 for phthalate content in toys and children care articles.

Detection limit = 0.01%(w/w)
ND = Not detected

Tested components：See component list in the last section of this report.

Date Sample Received： Dec.2, 2015
Testing Period： Dec.2, 2015 To Dec.7, 2015

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To be continued

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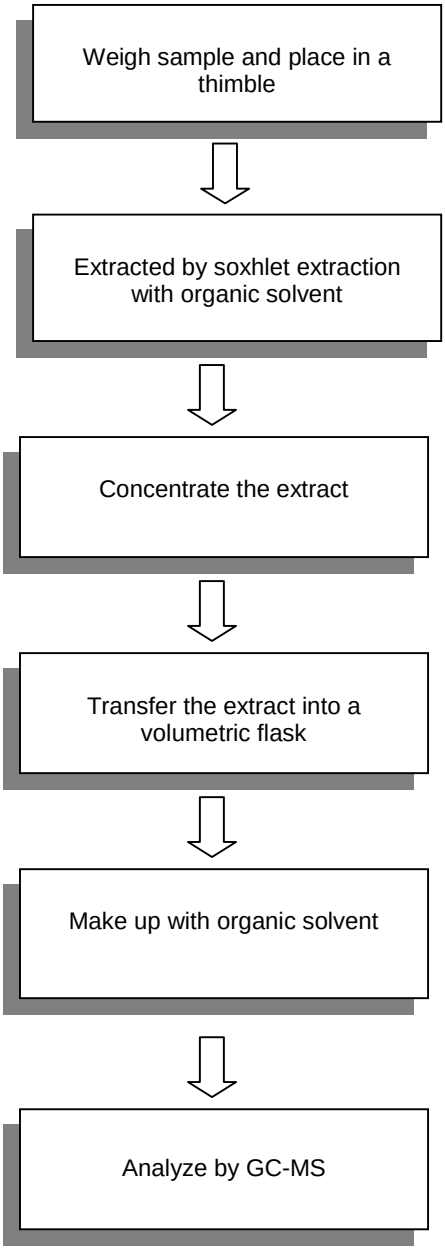
Tests Conducted

11 Measurement flowchart：

Test for phthalate content



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Tests Conducted

12 19 Toxic Elements Migration Test

(A) Test Result

As per BS EN 71-3：2013 + A1:2014 and followed by Inductively Coupled Plasma Atomic Emission Spectrometry, Inductively Coupled Argon Mass Spectrometry, Ion Chromatography-Inductively Coupled Plasma-Mass Spectrometry, and Gas Chromatographic - Mass Spectrometry.

Category (III)：Scraped-off toy material

Element	Result (mg/kg) (1)#	Limit (mg/kg)
Aluminium (Al)	< 300	70000
Antimony (Sb)	< 10	560
Arsenic (As)	< 10	47
Barium (Ba)	< 10	18750
Boron (B)	< 50	15000
Cadmium (Cd)	< 5	17
Chromium (III) (Cr III)	< 10	460
Chromium (VI) (Cr VI)	< 0.2	0.2
Cobalt (Co)	< 10	130
Copper (Cu)	< 10	7700
Lead (Pb)	< 10	160
Manganese (Mn)	< 10	15000
Mercury (Hg)	< 10	94
Nickel (Ni)	< 10	930
Selenium (Se)	< 10	460
Strontium (Sr)	< 100	56000
Tin (Sn)	< 10	180000
Organic tin	< 3.0	12
Zinc (Zn)	564	46000

Remark：mg/kg = milligram per kilogram
- Organic tin test result was expressed as tributyl tin.
- Unless specified, determination of Chromium (III), Chromium (VI) and Organic tin was based on elemental analysis.

= Confirmation of Chromium (VI) test was performed on the tested component.

Tested Components：See component list in the last section of this report.

(B) Categories of various toy materials

Category I：Dry, brittle, powder like or pliable

Solid toy material from which powder-like material is released during playing and semi-solid materials that may also leave residues on the hands during play. The material can be ingested. Contamination of the hands with the material may contribute to the oral exposure of the material. (e.g. the cores of colouring pencils, chalk, crayons, modelling clays and plaster).

Category II：Liquid or sticky

Fluid or viscous toy material, which can be ingested or to which dermal exposure may occur during playing. (e.g. liquid paints, finger paints, liquid ink in pens, glue sticks, slimes, bubble solution).

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Tests Conducted

Category III：Scraped-off

Solid toy material with or without a coating, which can be ingested as a result of biting, tooth scraping, sucking or licking. (e.g. coatings, lacquers, plastics, paper, textiles, glass, ceramic, metallic, wooden, bone , leather and other materials).

Tested Components：See component list in the last section of this report.

Date Sample Received： Dec.2, 2015
Testing Period： Dec.2, 2015 To Dec.8, 2015

13 Formaldehyde Content

As per test method EN ISO 17226-2:2008, formaldehyde content was determined by UV- Visible Spectrophotometer(UV-Vis) analysis.

Tested Component	Result (mg/kg)
(1)	ND

Remark：ND = Not Detected
Detection Limit = 5.0 mg/kg

Date Sample Received： Dec.2, 2015
Testing Period： Dec.2, 2015 To Dec.4, 2015

14 Perfluorooctane Sulfonates (PFOS) And Perfluorooctanoic Acid (PFOA) Content

By solvent extraction and followed by Liquid Chromatography-Mass Spectrometry (LC-MS) analysis.

Compound	Result (ppm)
Perfluorooctane sulfonates(PFOS)#	ND
Perfluorooctanoic acid(PFOA)	ND

Remark：Detection Limit = 0.1ppm
ppm = Parts per million = mg/kg
ND = Not Detected
# = The reported value was calculated by summation of the values of Perfluorooctanesulfonic Acid, Perfluorooctanesulfonamide, N-Methyl-Perfluorooctanesulfonamide, N-Ethyl-Perfluorooctanesulfonamide, N-Methyl-Perfluorooctanesulfonamidoethanol and N-Ethyl-Perfluorooctanesulfonamidoethanol.

Tested Components：See component list in the last section of this report.

Date Sample Received： Dec.2, 2015
Testing Period： Dec.2, 2015 To Dec.7, 2015

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To be continued

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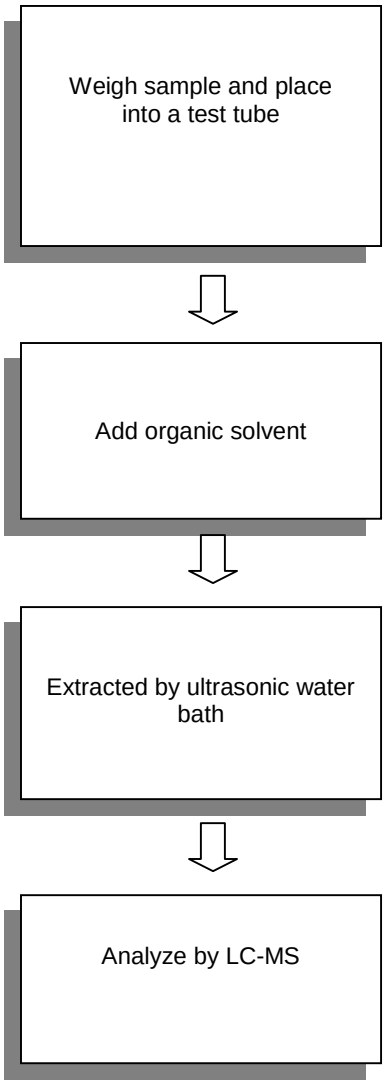
Tests Conducted

15 Measurement flowchart：

Test for **Perfluorooctane Sulfonates(PFOS)and Perfluorooctanoic Acid (PFOA)** content：



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To be continued

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Tests Conducted

16 Nonylphenol (NP), Octylphenol (OP), Nonylphenol Ethoxylates(NPEO)and Octylphenol Ethoxylates (OPEO) Content

By solvent extraction and followed by Liquid Chromatographic - Mass Spectrometric (LC-MS) analysis.

Compound	Result (ppm)
NP	<10
OP	<10
NPEO	<10
OPEO	<10

Remark: Detection Limit = 10 ppm
ppm = Parts per million = mg/kg

Tested Components: See component list in the last section of this report.

Date Sample Received: Dec.2, 2015
Testing Period: Dec.2, 2015 To Dec.7, 2015

17 Organotin Content

By solvent extraction, followed by Gas Chromatography - Mass Spectrometry (GC-MS) analysis.

Compound	Result (%, w/w) of tin (1)	Requirement (%, w/w) of tin
Tri-substituted Organotin[@]	<0.001	0.1
Dibutyl tin (DBT)	<0.001	0.1
Dioctyl tin (DOT)	<0.001	0.1

Remark: The above requirement was quoted according to Annex XVII item 20 of the Reach regulation (EC) No.1907/2006 & amendent (EU) No.276/2010 for organotin content.

Remarks: Detection Limit = 0.001% (w/w) of tin
[@] = The reported value was calculated by summation of the values of Tri-butyltin, Tri-phenyltin, Tri-methyltin, Tri-octyltin, Tri-cyclohexyltin

Tested Components: See component list in the last section of this report.

Date Sample Received: Dec.2, 2015
Testing Period: Dec.2, 2015 To Dec.7, 2015

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Tests Conducted

18 Polychlorinated biphenyls (PCBs)

By solvent extraction and Gas Chromatography-Mass Spectrometry (GC-MS) or Electron Capture Detector (GC-ECD) analysis.

Compound determined: PCB-28, PCB -52, PCB -101, PCB -153, PCB -138, PCB –180

Tested Component	Result(Total) (ppm)	Requirement (ppm)
(1)	ND	Not used(<1.0ppm)

Remark: Detection Limit = 0.5ppm
ppm = Parts per million = mg/kg
ND = Not Detected

Tested Component: See component list in the last section of this report.

Date Sample Received： Dec.2, 2015
Testing Period： Dec.2, 2015 To Dec.7, 2015

19 Asbestos

As per test method NIOSH 9002, Asbestos qualitative test was determined by microscopic examination method.

Tested Component	Result
(1)	negative

Analyte：Actinolite, Amosite, Crocidolite, Tremolite, Anthophyllite, Chrysotile

Tested Component：See component list in the last section of this report.

Date Sample Received： Dec.2, 2015
Testing Period： Dec.2, 2015 To Dec.5, 2015

20 Qualitative Test For Polyvinyl Chloride(PVC)

With solvent extraction,by Fourier Transform Infrared spectrometer(FTIR) test.

Result：Polyvinyl Chloride (PVC) was not detected on tested component (1) of the submitted sample.

Tested Component：See component list in the last section of this report.

Date Sample Received： Dec.2, 2015
Testing Period： Dec.2, 2015 To Dec.5, 2015

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To be continued

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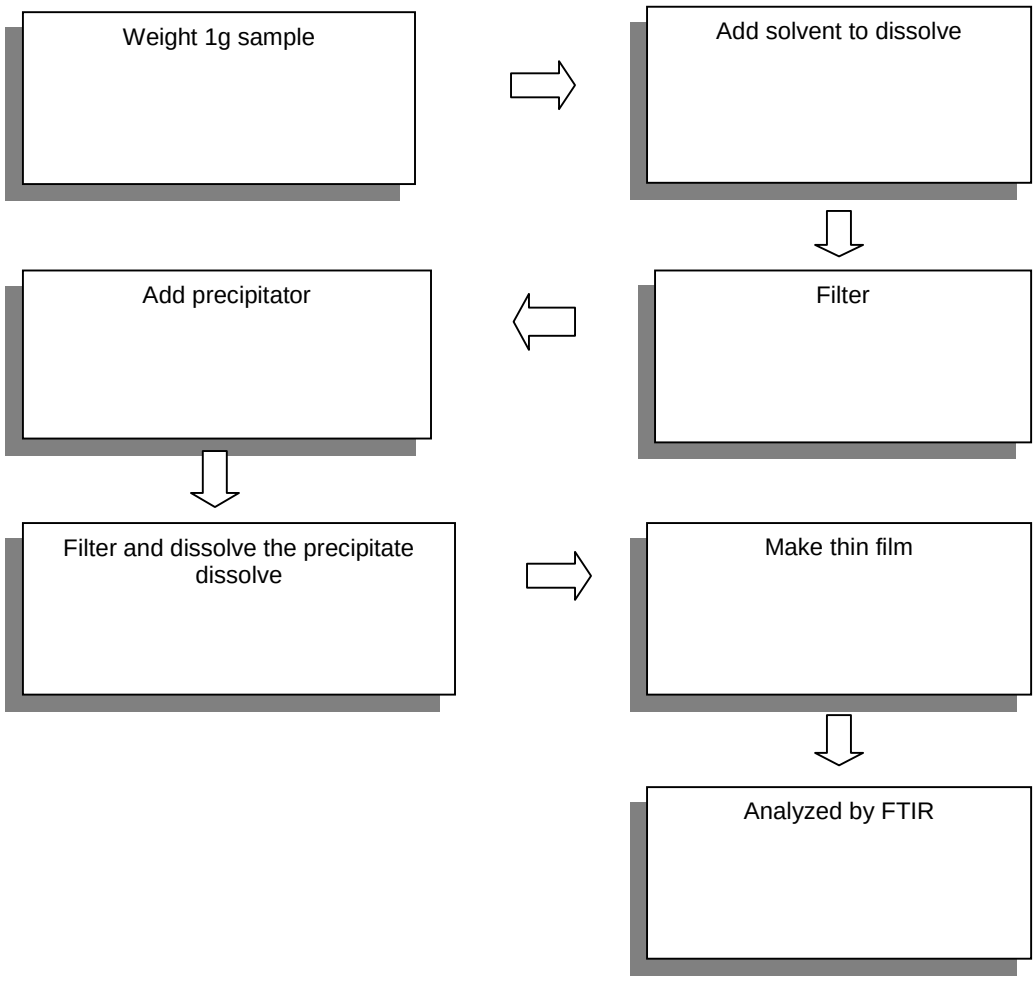
Tests Conducted

21 Determination Of PVC Flow Chart



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Tests Conducted

22 Detection of Ozone Depleting Substance (ODS)

With reference to US EPA 5021A / 8260C and determined by Headspace - Gas Chromatography Mass Spectrometric (HS - GC/MS) analysis.

	Tested Component
Test Item	Result (mg/kg)
	(1)
Chlorofluorocarbon (CFCs) (Group I)	ND
Halon (Group II)	ND
Chlorofluorocarbon (CFCs) (Group III)	
Carbon Tetrachloride (CCl_4)(Group IV)	ND
1,1,1-Trichloroethane (Group V)	ND
Bromomethane (Group VI)	3
Hydrobromofluorocarbon (HBFCs) (Group VII)	
Hydrochlorofluorocarbon (HCFCs) (Group VIII)	ND
Bromochloromethane (Group IX)	

Remark：Details of Group I to Group IX Ozone Depleting Chemicals are listed in annex I
ND = Not Detected
Detection limit = 1 mg/kg

Tested Component(s)：See component list in the last section of this report.

Date Sample Received： Dec.2, 2015
Testing Period： Dec.2, 2015 To Dec.8, 2015

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To be continued

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Tests Conducted

23 Flame Retardants

By solvent extraction, followed by Gas Chromatography Mass Spectrometric (GC/MS) and Liquid Chromotography Mass Spectrometric (LC/MS) analysis.

Test item	CAS No	Result (mg/kg) Tested component (1)	Reporting limit (mg/kg)
Polychlorinated naphthalenes (PCNs)	--	ND	5

ND = Not Detected

Tested Components: (1) Black plastic with white printing (V4-9.0-0-FSP-SM).

Picture of sample

Date Sample Received： Dec.8, 2015

Testing Period： Dec.8, 2015 To Dec.14, 2015

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Component List：

(1) Black plastic tube

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End of report

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