



## Test Report

No. JQL170803006-2R

Date: Aug.11,2017

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### Applicant:

Address:

### Manufacturer:

Address:

The following samples were submitted and identified on behalf of the clients

**Sample Name:** Sports DV or Action camera

**Model:**

**Brand Name:** --

**Sample Received Date:** Aug.03, 2017

**Test Period:** From Aug.03, 2017 to Aug.11, 2017

**Test Requested:** In accordance with The RoHS Directive 2011/65/EU Annex II  
—Lead, Cadmium, Mercury, Hexavalent Chromium, PBBs and PBDEs Content

**Test Method:** Please refer to next pages

### Result Summary:

Item	Test parameter	Conclusion
1	Lead, Cadmium, Mercury, Hexavalent Chromium, PBBs and PBDEs Content—RoHS Directive 2011/65/EU Annex II	<b>PASS</b>

**Signed for and on behalf of**

**Shenzhen Jialian Testing Consulting Co., Ltd.**



**Lris Ma**

**Approved Signatory**

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### Prepared By:

Shenzhen Jialian Testing Consulting Co., Ltd.

5/F, 7 Building, XinYuan Industrial Park, Xili Town, NanShan District, ShenZhen City, GuangDong Province, P.R.CHINA

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### Sample Description:

No.	Sample Name	Part Name	Description
1-1	Camera Case	Black Case	Black Plastics
1-2	Camera Case	Signal Lamp Window	Transparent Plastics
1-3	Camera Case	Transparent Film	Transparent Plastics Film
2-1	LCD Screen	Optical Component	Multilayer Transparent Parts
2-2	LCD Screen	Electrical Component	Electrical Component
3-1	Camera	Optical Component	Glass Lens
3-2	Camera	Encapsulate Part	Mixed All Black Plastics
3-3	Camera	Mechanical Part	Mechanical Metal Part
3-4	Camera	Electrical Control Part	Electrical Component
3-5	Camera	Wide-Angle Lens	Glass Lens
4-1	PCB	PCB	Mixed All Camera PCB
4-2	PCB	Mixed All Electronic Components	Mixed All Electronic Components
4-3	PCB	Mixed All Insulation Parts	Mixed All Insulation Parts
4-4	PCB	Solder Bonding Ball	Silvery Soldering Tin
5-1	Communication Interface	Mixed All Metal Parts	Silvery Metal
5-2	Communication Interface	Mixed All Plastics Parts	Plastics
6-1	Button	Camera Plastics Button	Black Plastics
6-2	Button	DV Metal Button/Spring	Silvery Metal
6-3	Button	Electrical Connection	Carbon Graphite Film
7-1	DV Case	Transparent Case	Transparent Plastics
7-2	DV Case	Seal Ring	White Rubber Gasket
8-1	Stand Holder	Mixed All Plastics Parts	Black Plastics
8-2	Stand Holder	Mixed All Metal Parts	Metal
8-3	Stand Holder	Mixed All Rubber Parts	Black Rubber
9-1	Data Line	Outer Shell	Black Plastics
9-2	Data Line	Inner Metal Wire	Metal Line
9-3	Data Line	Mixed Metal Part	Silvery Metal
9-4	Data Line	Mixed Plastics Part	White Plastics
10-1	Fastener	Mixed All Metal Screw	Silvery Metal

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**Test Methods:** with reference to IEC 62321:2013

- (1) Determination of Cadmium by ICP-OES
- (2) Determination of Lead by ICP-OES
- (3) Determination of Mercury by ICP-OES
- (4) Determination of Hexavalent Chromium by Colorimetric Method using UV-Vis
- (5) Determination of PBBs/PBDEs content by GC-MS

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### XRF Results:

No.	Sample Name	Part Name	Pb (ppm)	Cd (ppm)	Hg (ppm)	Cr (ppm)	Br (ppm)
1-1	Camera Case	Black Case	BL	BL	BL	BL	IN
1-2	Camera Case	Signal Lamp Window	BL	BL	BL	BL	IN
1-3	Camera Case	Transparent Film	BL	BL	BL	BL	IN
2-1	LCD Displayer	Optical Component	BL	BL	BL	BL	IN
2-2	LCD Displayer	Electrical Component	BL	BL	BL	BL	BL
3-1	Camera	Optical Component	BL	BL	BL	BL	BL
3-2	Camera	Encapsulate Part	BL	BL	BL	BL	IN
3-3	Camera	Mechanical Part	BL	BL	BL	BL	BL
3-4	Camera	Electrical Control Part	BL	BL	BL	BL	BL
3-5	Camera	Wide-Angle Lens	BL	BL	BL	BL	BL
4-1	PCB	PCB	BL	BL	BL	BL	IN
4-2	PCB	Mixed All Electronic Components	BL	BL	BL	BL	BL
4-3	PCB	Mixed All Insulation Parts	BL	BL	BL	BL	IN
4-4	PCB	Solder Bonding Ball	BL	BL	BL	BL	BL
5-1	Communication Interface	Mixed All Metal Parts	BL	BL	BL	BL	BL
5-2	Communication Interface	Mixed All Plastics Parts	BL	BL	BL	BL	IN
6-1	Button	Camera Plastics Button	BL	BL	BL	BL	IN
6-2	Button	DV Metal Button/Spring	BL	BL	BL	BL	BL
6-3	Button	Electrical Connection	BL	BL	BL	BL	BL
7-1	DV Case	Transparent Case	BL	BL	BL	BL	IN
7-2	DV Case	Seal Ring	BL	BL	BL	BL	IN
8-1	Stand Holder	Mixed All Plastics Parts	BL	BL	BL	BL	IN
8-2	Stand Holder	Mixed All Metal Parts	BL	BL	BL	BL	BL
8-3	Stand Holder	Mixed All Rubber Parts	BL	BL	BL	BL	IN
9-1	Data Line	Outer Shell	BL	BL	BL	BL	IN
9-2	Data Line	Inner Metal Wire	BL	BL	BL	BL	BL
9-3	Data Line	Mixed Metal Part	BL	BL	BL	BL	BL
9-4	Data Line	Mixed Plastics Part	BL	BL	BL	BL	IN
10-1	Fastener	Mixed All Metal Screw	BL	BL	BL	BL	BL

### NOTE:

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- ppm=mg/kg=parts per million      -BL=Below Limit      - N.A.=Not Analysis
  - IN= Inconclusive, chemical analysis necessary
- Testing results are only used for reference.

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### Chemical Test Results:

Flame Retardants	MDL	Law Limit	Result(ppm)					
			1-1	1-2	1-3	2-1	3-2	4-1
Polybrominated Biphenyls (Mono- Deca)(PBBs)	---	---	---	---	---	---	---	---
Monobromobiphenyl	5ppm	1000 ppm	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Dibromobiphenyl	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Tribromobiphenyl	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Tetrabromobiphenyl	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Pentabromobiphenyl	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Hexabromobiphenyl	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Heptabromobiphenyl	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Octabromobiphenyl	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Nonabromobiphenyl	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Decabromobiphenyl	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Polybrominated Diphenylethers (Mono - Deca) (PBDEs)	---	---	---	---	---	---	---	---
Monobromobiphenyl ether	5ppm	1000 ppm	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Dibromobiphenyl ether	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Tribromobiphenyl ether	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Tetrabromobiphenyl ether	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Pentabromobiphenyl ether	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Hexabromobiphenyl ether	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Heptabromobiphenyl ether	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Octabromobiphenyl ether	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Nonabromobiphenyl ether	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Decabromobiphenyl ether	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.

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Flame Retardants	MDL	Law Limit	Result(ppm)					
			4-3	5-2	6-1	7-1	7-2	8-1
Polybrominated Biphenyls (Mono- Deca)(PBBs)	---	---	---	---	---	---	---	---
Monobromobiphenyl	5ppm	1000 ppm	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Dibromobiphenyl	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Tribromobiphenyl	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Tetrabromobiphenyl	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Pentabromobiphenyl	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Hexabromobiphenyl	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Heptabromobiphenyl	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Octabromobiphenyl	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Nonabromobiphenyl	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Decabromobiphenyl	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Polybrominated Diphenylethers (Mono - Deca) (PBDEs)	---	---	---	---	---	---	---	---
Monobromobiphenyl ether	5ppm	1000 ppm	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Dibromobiphenyl ether	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Tribromobiphenyl ether	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Tetrabromobiphenyl ether	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Pentabromobiphenyl ether	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Hexabromobiphenyl ether	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Heptabromobiphenyl ether	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Octabromobiphenyl ether	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Nonabromobiphenyl ether	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Decabromobiphenyl ether	5ppm		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.

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Flame Retardants	MDL	Law Limit	Result(ppm)					
			8-3	9-1	9-4			
Polybrominated Biphenyls (Mono- Deca)(PBBs)	---	---	---	---	---			
Monobromobiphenyl	5ppm	1000 ppm	N.D.	N.D.	N.D.			
Dibromobiphenyl	5ppm		N.D.	N.D.	N.D.			
Tribromobiphenyl	5ppm		N.D.	N.D.	N.D.			
Tetrabromobiphenyl	5ppm		N.D.	N.D.	N.D.			
Pentabromobiphenyl	5ppm		N.D.	N.D.	N.D.			
Hexabromobiphenyl	5ppm		N.D.	N.D.	N.D.			
Heptabromobiphenyl	5ppm		N.D.	N.D.	N.D.			
Octabromobiphenyl	5ppm		N.D.	N.D.	N.D.			
Nonabromobiphenyl	5ppm		N.D.	N.D.	N.D.			
Decabromobiphenyl	5ppm		N.D.	N.D.	N.D.			
Polybrominated Diphenylethers (Mono - Deca) (PBDEs)	---	---	---	---	---			
Monobromobiphenyl ether	5ppm	1000 ppm	N.D.	N.D.	N.D.			
Dibromobiphenyl ether	5ppm		N.D.	N.D.	N.D.			
Tribromobiphenyl ether	5ppm		N.D.	N.D.	N.D.			
Tetrabromobiphenyl ether	5ppm		N.D.	N.D.	N.D.			
Pentabromobiphenyl ether	5ppm		N.D.	N.D.	N.D.			
Hexabromobiphenyl ether	5ppm		N.D.	N.D.	N.D.			
Heptabromobiphenyl ether	5ppm		N.D.	N.D.	N.D.			
Octabromobiphenyl ether	5ppm		N.D.	N.D.	N.D.			
Nonabromobiphenyl ether	5ppm		N.D.	N.D.	N.D.			
Decabromobiphenyl ether	5ppm		N.D.	N.D.	N.D.			

### Note:

1. ppm=mg/kg

2. N.D.=Not Detected (Not detected is reported when the reading is less than detection limit value.)

3. Negative=absence of Cr(VI) in the metallic sample

Positive= presence of Cr(VI) in the metallic sample

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

Boiling-water-extraction:

Negative=absence of Cr(VI) in the metallic sample

Positive=presence of Cr(VI) in the metallic sample

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

4. #=Positive indicates the presence of Cr(VI) on the tested areas and result the regarded as not

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comply with RoHS requirement.

Negative indicates the presence of Cr(VI) on the tested areas and result the regarded as comply with RoHS requirement

5. MDL=Method Detection Limit

### Remark:

(1) (a) It is the result on total Br while test item on restricted substances is PBBs/PBDEs. It is the result on total Cr while test item on restricted substances is Cr<sup>6+</sup>.

(b) Results are obtained by EDXRF for primary screening, and further chemical testing by ICP(for Cd, Pb, Hg), UV-VIS(for CrVI) and GCMSD (for PBBs, PBDEs) is recommended to be performed. If the concentration exceeds the below warning value according to IEC 62321 Ed.1 111/95/2<sup>nd</sup> CDV (unit: mg/kg)

Element	Polymer	Metal	Composite Materials
Cd	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$LOD < X < (150+3\sigma) \leq OL$
Pb	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
Hg	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
Br	$BL \leq (300-3\sigma) < X$	---	$BL \leq (250-3\sigma) < X$
Cr	$BL \leq (700-3\sigma) < X$	$BL \leq (700-3\sigma) < X$	$BL \leq (500-3\sigma) < X$

(c) OL=Over Limit, BL=Below Limit. LOD=limit of Detection, ---=not conducted.

(d) The XRF screening test for RoHS elements- The reading may be different to the actual content in the sample be of non-uniformity composition.

(2) (a)mg/kg=ppm=0.0001%, N.D.=not detected(<MDL),

(b)Unit and Method Detection Limit(MDL) in wet chemical test.

Test Items	Pb	Cd	Hg
Units	Mg/kg	Mg/kg	Mg/kg
MDL	2	2	2

The MDL for single compound of PBBs & PBDEs is 5mg/kg and MDL of Cr<sup>6+</sup> for polymer & composite sample is 2mg/kg.

(c) According to IEC 62321 Ed.1 111/95/2<sup>nd</sup> CDV, result on Cr<sup>6+</sup> for metal sample is shown as Positive/Negative.

Negative=Absence of Cr<sup>6+</sup> coating, Positive= Persence of Cr<sup>6+</sup> coating.

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### Appendix 1:

#### Photo of Submitted Sample



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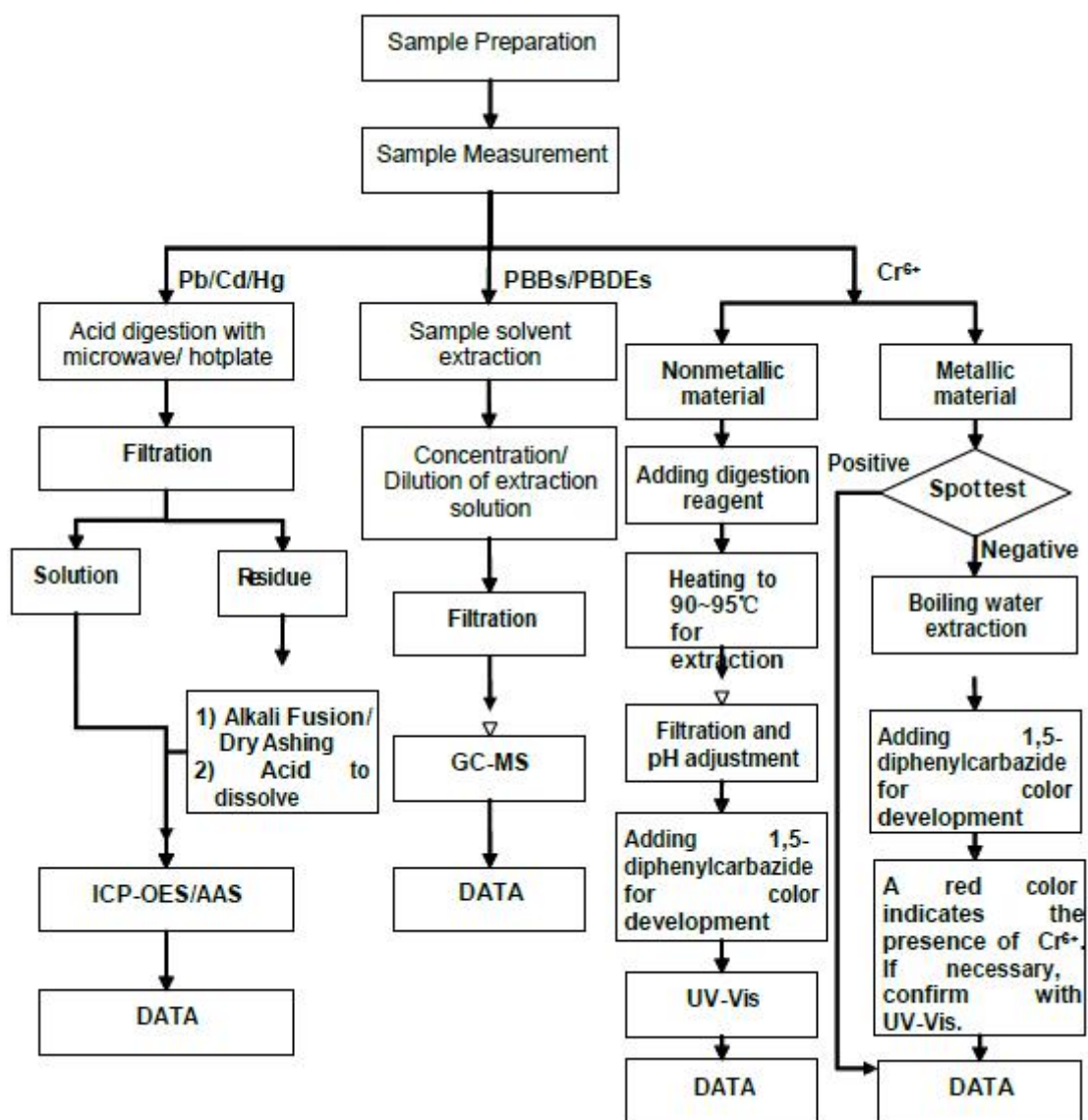
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### Appendix 2:

#### RoHS Testing Flow Chart

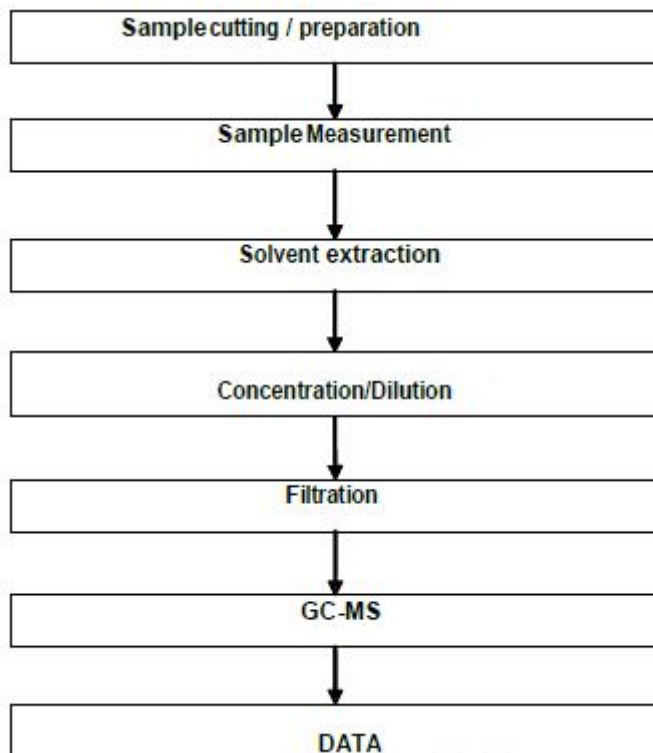
These samples were dissolved totally by pre-conditioning method according to below flow chart (Cr6+ and PBBs/PBDEs test method excluded).



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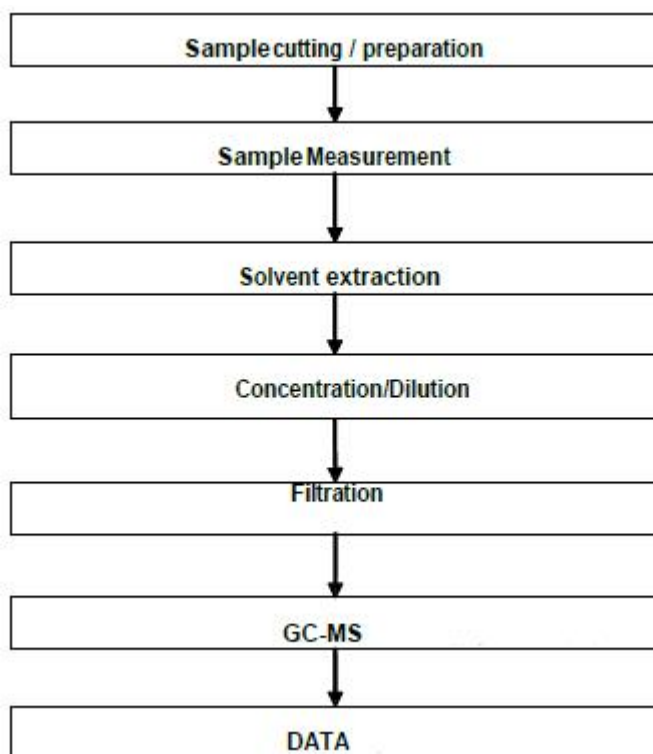


**HBCDD Testing FlowChart**





**Phthalates Testing Flow Chart**



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