

**Test Report** No.: SHAEC23006090101 Date: May 24, 2023 Page 1 of 27

Client Name: Eterkon Semiconductor Materials Co., Ltd.

Client Address: 267 Qingyang Rd.(M), Kunshan, Jiangsu Province, P.R. China

Sample Name: EPOXY MOLDING COMPOUND

Model No.: EK-1700

Client Ref. Information: EK-1800A, EK-1800A3,

EK-1800A4, EK-1800F,

EK-1800T,

EK-1700F, EK-1700H3, EK-1700S, EK-1700K, EK-1700L, EK-1700LR,

EK-1700HR, EK-1700HT, EK-1700FY

EK-3600T, EK-3600L, EK-3600K, EK-3600H, EK-3600TC,EK-3600TF, EK-3600TR, EK-3600TH, EK-3600TM, EK-3600TL, EK-3600HR, EK-3600TY

**EK-200W** 

Lot No.: 2023.04

The above sample(s) and information were provided by the client.

.....

SGS Job No.: SHP23-002061 Sample Receiving Date: May 15, 2023

Testing Period: May 15, 2023 ~ May 24, 2023

Test Requested: Select test(s) as requested by the client.

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

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

Signed for and on behalf of

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

Carol Luo

Approved Signatory





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t E&E (86–21) 61402553 f E&E (86–21)64953679 t HL (86–21) 61402594 f HL (86–21)61156899



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Test Requirement	Conclusion
EU RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU- Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs), Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP)	Pass
Alkanes C10-C13, chloro (short chain-chlorinated paraffins) (SCCPs)	See Results
Element(s)	See Results
Halogen	See Results
Hexabromocyclododecane (HBCDD)	See Results
Phthalates	See Results
Polychlorinated Biphenyls (PCBs)	See Results
Polychlorinated Naphthalenes (PCNs)	See Results
Polychlorinated Terphenyls (PCTs)	See Results
Polyvinyl chloride (PVC)	See Results
Red Phosphorus	See Results
TBBP-A	See Results
Organic-tin compounds	See Results
Perfluorooctane Sulfonates (PFOS) and its derivatives and Perfluorooctanoic Acid (PFOA) and its salts	See Results
Polycyclic Aromatic Hydrocarbons (PAHs)	See Results

#### Test Result(s):

Test Part Description:

SN ID	Sample No.	SGS Sample ID	Description
SN1	A1	SHA23-0060901-0001.C001	Grey solid

#### Remarks:

- (1) 1 mg/kg = 1 ppm = 0.0001%
- (2) MDL = Method Detection Limit
- (3) ND = Not Detected (< MDL)
- (4) "-" = Not Regulated

EU RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU- Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs), Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP)



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Test Method: With reference to IEC 62321-4:2013+AMD1:2017, IEC 62321-5:2013, IEC 62321-7-2:2017,

IEC 62321-6:2015 and IEC 62321-8:2017, analysis was performed by ICP-OES, UV-Vis

and GC-MS.

Test Item(s)	Limit	Unit(s)	MDL	A1
Cadmium(Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	ND
Mercury (Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))	1000	mg/kg	8	ND
Polybromobiphenyl (PBBs)	1000	mg/kg	-	ND
Monobromobiphenyl (MonoBB)	-	mg/kg	5	ND
Dibromobiphenyl (DiBB)	-	mg/kg	5	ND
Tribromobiphenyl (TriBB)	-	mg/kg	5	ND
Tetrabromobiphenyl (TetraBB)	-	mg/kg	5	ND
Pentabromobiphenyl (PentaBB)	-	mg/kg	5	ND
Hexabromobiphenyl (HexaBB)	-	mg/kg	5	ND
Heptabromobiphenyl (HeptaBB)	-	mg/kg	5	ND
Octabromobiphenyl (OctaBB)	-	mg/kg	5	ND
Nonabromobiphenyl (NonaBB)	-	mg/kg	5	ND
Decabromobiphenyl (DecaBB)	-	mg/kg	5	ND
Polybromodiphenyl ether(PBDEs)	1000	mg/kg	-	ND
Monobromodiphenylether (MonoBDE)	-	mg/kg	5	ND
Dibromodiphenylether (DiBDE)	-	mg/kg	5	ND
Tribromodiphenylether (TriBDE)	-	mg/kg	5	ND
Tetrabromodiphenylether (TetraBDE)	-	mg/kg	5	ND
Pentabromodiphenylether (PentaBDE)	-	mg/kg	5	ND
Hexabromodiphenylether (HexaBDE)	-	mg/kg	5	ND
Heptabromodiphenylether (HeptaBDE)	-	mg/kg	5	ND
Octabromodiphenylether (OctaBDE)	-	mg/kg	5	ND
Nonabromodiphenylether (NonaBDE)	-	mg/kg	5	ND
Decabromodiphenylether (DecaBDE)	-	mg/kg	5	ND
Dibutyl Phthalate(DBP)	1000	mg/kg	50	ND
Benzyl Butyl Phthalate(BBP)	1000	mg/kg	50	ND
Bis-(2-ethylhexyl) Phthalate(DEHP)	1000	mg/kg	50	ND
Diisobutyl Phthalate(DIBP)	1000	mg/kg	50	ND

#### Notes:

- (1) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.
- (2) IEC 62321 series is equivalent to EN 62321 series.
- (3) The restriction of DEHP, BBP, DBP and DIBP shall apply to medical devices, including in vitro medical devices, and monitoring and control instruments, including industrial monitoring and control instruments, from 22 July 2021.

#### Alkanes C10-C13, chloro (short chain-chlorinated paraffins) (SCCPs)

Test Method: With reference to ISO 18219-1:2021, analysis was performed by GC-NCI-MS.

Test Item(s)	CAS No.	Unit(s)	MDL	A1
Short Chain Chlorinated Paraffin(C10-C13)(SCCP)	85535-84-8	mg/kg	50	ND



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## Element(s)

Test Method: With reference to US EPA 3052:1996, analysis was performed by ICP-OES.

Test Item(s)	Unit(s)	MDL	A1
Arsenic(As)	mg/kg	10	ND
Beryllium(Be)	mg/kg	5	ND
Antimony(Sb)	mg/kg	10	3869

#### **Halogen**

Test Method: With reference to EN 14582:2016, analysis was performed by IC.

Test Item(s)	Unit(s)	MDL	A1
Fluorine(F)	mg/kg	20	ND
Chlorine(CI)	mg/kg	50	115
Bromine(Br)	mg/kg	50	3974
lodine(I)	mg/kg	50	ND

## **Hexabromocyclododecane (HBCDD)**

Test Method: With reference to IEC 62321-9:2021, analysis was performed by GC-MS.

Test Item(s)	CAS No.	Unit(s)	MDL	A1
	134237-50-6			
	/134237-51-7			
Hexabromocyclododecane (HBCDD)	/134237-52-8	mg/kg	20	ND
	/25637-99-4			
	/3194-55-6			

# **Phthalates**

Test Method: With reference to IEC 62321-8:2017, analysis was performed by GC-MS.

Test Item(s)	CAS No.	Unit(s)	MDL	A1
Diisononyl Phthalate (DINP)	28553-12-0 /68515-48-0	mg/kg	50	ND
Di-n-Octyl Phthalate(DNOP)	117-84-0	mg/kg	50	ND
Diisodecyl Phthalate (DIDP)	26761-40-0 /68515-49-1	mg/kg	50	ND
Bis(2-methoxyethyl)phthalate(DMEP)	117-82-8	mg/kg	50	ND
Di-n-Hexyl Phthalate(DnHP)	84-75-3	mg/kg	50	ND
Dipentyl Phthalate	131-18-0	mg/kg	50	ND
Diphenyl Phthalate(DPhP)	84-62-8	mg/kg	50	ND
Dimethyl Phthalate(DMP)	131-11-3	mg/kg	50	ND
Diethyl Phthalate(DEP)	84-66-2	mg/kg	50	ND
Dipropyl Phthalate(DPrP)	131-16-8	mg/kg	50	ND
Dicyclohexyl Phthalate(DCHP)	84-61-7	mg/kg	50	ND
Dibenzyl Phthalate(DBzP)	523-31-9	mg/kg	50	ND



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Test Item(s)	CAS No.	Unit(s)	MDL	A1
Dinonyl Phthalate(DNP)	84-76-4	mg/kg	50	ND
Diisooctyl Phthalate(DIOP)	27554-26-3	mg/kg	50	ND
Diisopentyl Phthalate(DIPP)	605-50-5	mg/kg	50	ND
1,2-Benzenedicarboxylic Acid,di-C6-8-branched alkyl esters,C7-rich(DIHP)	71888-89-6	mg/kg	50	ND
1,2-Benzenedicarboxylic Acid,Di-C7-11- Branched and Linear Alkyl Esters(DHNUP)	68515-42-4	mg/kg	50	ND
1,2-Benzenedicarboxylic Acid,di-C6-10- Alkyl Esters1,2-Benzenedicarboxylic Acid,Mixed Decyl and Hexyl and Octyl Diesters with ≥ 0.3% of Dihexyl Phthalate	68515-51-5 /68648-93-1	mg/kg	100	ND

# **Polychlorinated Biphenyls (PCBs)**

Test Method: With reference to US EPA 8082A:2007, analysis was performed by GC-MS.

Test Item(s)	CAS No.	Unit(s)	MDL	A1
2,4,4'-Trichlorobiphenyl (PCB28)	7012-37-5	mg/kg	0.5	ND
2,2',5,5'-Tetrachlorobiphenyl (PCB52)	35693-99-3	mg/kg	0.5	ND
2,2',4,5,5'-Pentachlorobiphenyl (PCB101)	37680-73-2	mg/kg	0.5	ND
2,3',4,4',5-Pentachlorobiphenyl (PCB118)	31508-00-6	mg/kg	0.5	ND
2,2',3,4,4',5'-Hexachlorobiphenyl (PCB138)	35065-28-2	mg/kg	0.5	ND
2,2',4,4',5,5'-Hexachlorobiphenyl (PCB153)	35065-27-1	mg/kg	0.5	ND
2,2',3,4,4',5,5'-Heptachlorobiphenyl (PCB180)	35065-29-3	mg/kg	0.5	ND
Sum of PCBs	-	mg/kg	-	ND

# **Polychlorinated Naphthalenes (PCNs)**

Test Method: With reference to US EPA 8081B:2007, analysis was performed by GC-MS.

Test Item(s)	CAS No.	Unit(s)	MDL	A1
1-Chlorinated Naphthalene	90-13-1	mg/kg	5	ND
2-Chlorinated Naphthalene	91-58-7	mg/kg	5	ND
1,4- Dichlorinated Naphthalene	1825-31-6	mg/kg	5	ND
1,5-Dichlorinated Naphthalene	1825-30-5	mg/kg	5	ND
1,2-Dichlorinated Naphthalene	2050-69-3	mg/kg	5	ND
1,8-Dichlorinated Naphthalene	2050-74-0	mg/kg	5	ND
1,2,3-Trichlorinated Naphthalene	50402-52-3	mg/kg	5	ND
1,2,3,4-Tetrachlorinated Naphthalene	20020-02-4	mg/kg	5	ND
1,2,3,4,6-Pentachlorinated Naphthalene	67922-26-3	mg/kg	5	ND
Octa-chlorinated Naphthalene	2234-13-1	mg/kg	5	ND



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#### **Polychlorinated Terphenyls (PCTs)**

Test Method: With reference to US EPA 8082A: 2007, analysis was performed by GC-MS.

Test Item(s)	CAS No.	Unit(s)	MDL	A1
Aroclor 5432	63496-31-1	mg/kg	0.5	ND
Aroclor 5442	12642-23-8	mg/kg	0.5	ND
Aroclor 5460	11126-42-4	mg/kg	0.5	ND

# Polyvinyl chloride (PVC)

With reference to SGS in house method, analysis was performed by FTIR/HATR. Test Method:

Test Item(s)	A1
Polyvinyl chloride (PVC)	Negative

#### Notes:

(1) Negative=The sample does not contain Polyvinylchloride (PVC), Positive=The sample contains Polyvinylchloride (PVC)

# **Red Phosphorus**

Test Method: With reference to SGS In house method, analysis was performed by ICP-OES and

Pyrolysis-GC-MS.

Test Item(s)	CAS No.	Unit(s)	MDL	A1
Red Phosphorus	7723-14-0	mg/kg	500	ND

#### Notes:

(1) The testing result is based on the worst-case scenario, and confirmed by Pyrolysis-GC-MS.

#### TBBP-A

Test Method: With reference to US EPA 3540C:1996, analysis was performed by GC-MS/LC-MS.

Test Item(s)	CAS No.	Unit(s)	MDL	A1
TBBP-A	79-94-7	mg/kg	10	ND

# **Organic-tin compounds**

Test Method: With reference to ISO 17353:2004, analysis was performed by GC-MS.

Test Item(s)	Unit(s)	MDL	A1
Dibutyl tin(DBT)	mg/kg	0.02	ND
Tributyl tin(TBT)	mg/kg	0.02	ND
Dioctyl tin(DOT)	mg/kg	0.02	ND
Tri-n-propyltin(TPT)	mg/kg	0.02	ND
Bis(tributyltin) oxide (TBTO) ◆	mg/kg	0.02	ND

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(1) ◆ TBTO is back calculated based on the worst-case scenario of TBT.

### Perfluorooctane Sulfonates (PFOS) and its derivatives and Perfluorooctanoic Acid (PFOA) and its salts

Test Method: With reference to CEN/TS 15968:2010, analysis was performed by HPLC-MS or LC-

MS/MS.

Test Item(s)	CAS No.	Unit(s)	MDL	A1
PFOS and its derivatives	=	mg/kg	•	ND
Perfluorooctane Sulfonates(PFOS)*	=	mg/kg	0.010	ND
N-ethylperfluoro-1-octanesulfonamide (N-EtFOSA)	4151-50-2	mg/kg	0.010	ND
N-methylperfluoro-1-octanesulfonamide (N-MeFOSA)	31506-32-8	mg/kg	0.010	ND
2-(N-ethylperfluoro-1- octanesulfonamido) -ethanol (N- EtFOSE)	1691-99-2	mg/kg	0.010	ND
2-(N-methylperfluoro-1- octanesulfonamido) -ethanol (N- MeFOSE)	24448-09-7	mg/kg	0.010	ND
Perfluorooctane Sulfonamide (PFOSA)	754-91-6	mg/kg	0.010	ND
Perfluorooctanoic Acid (PFOA) and its salts*	-	mg/kg	0.010	ND

#### Notes:

(1) Perfluorooctanoic acid (PFOA) and its salts\* including PFOA (CAS No. 335-67-1), APFO (CAS No. 3825-26-1), PFOA-Na (CAS No. 335-95-5), PFOA-K (CAS No. 2395-00-8), PFOA-Ag (CAS No. 335-93-3) and PFOA-F (CAS No. 335-66-0). The result of PFOA is used to represent PFOA and its salts.

(2) Perfluorooctane sulfonates (PFOS) and its salts\* including PFOS (CAS No. 1763-23-1), POSF(CAS No. 307-35-7), PFOS-K (CAS No. 2795-39-3), PFOS-NH4 (CAS No. 29081-56-9), PFOS-N(C10H21)2(CH3)2 (CAS No. 251099-16-8), PFOS-NH<sub>2</sub>(C<sub>2</sub>H<sub>4</sub>OH)<sub>2</sub> ( CAS No. 70225-14-8), PFOS-Li (CAS No. 29457-72-5), PFOS-N(C<sub>2</sub>H<sub>5</sub>)<sub>4</sub> (CAS No. 56773-42-3) and PFOS-Na (CAS No. 4021-47-0). The result of PFOS is used to represent PFOS and its salts.

#### Polycyclic Aromatic Hydrocarbons (PAHs)

With reference to AfPS GS 2019:01 PAK, analysis was performed by GC-MS. Test Method:

Test Item(s)	CAS No.	Unit(s)	MDL	A1
Benzo(a)pyrene(BaP)	50-32-8	mg/kg	0.1	ND
Benzo(e)pyrene(BeP)	192-97-2	mg/kg	0.1	ND
Benzo(a)anthracene(BaA)	56-55-3	mg/kg	0.1	ND
Benzo(b)Fluoranthene(BbF)	205-99-2	mg/kg	0.1	ND
Benzo(j)fluoranthene(BjF)	205-82-3	mg/kg	0.1	ND
Benzo(k)Fluoranthene(BkF)	207-08-9	mg/kg	0.1	ND
Chrysene(CHR)	218-01-9	mg/kg	0.1	ND
Dibenzo(a,h)Anthracene(DBA)	53-70-3	mg/kg	0.1	ND
Benzo(g,h,i)perylene(BPE)	191-24-2	mg/kg	0.1	ND
Indeno(1,2,3-c,d)pyrene(IPY)	193-39-5	mg/kg	0.1	ND



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Test Item(s)	CAS No.	Unit(s)	MDL	A1
Phenanthrene(PHE)	85-01-8	mg/kg	0.1	ND
Pyrene(PYR)	129-00-0	mg/kg	0.1	ND
Anthracene(ANT)	120-12-7	mg/kg	0.1	ND
Fluoranthene(FLT)	206-44-0	mg/kg	0.1	ND
Sum of Phenanthrene(PHE), Pyrene(PYR), Anthracene(ANT),	-	mg/kg	-	ND
Fluoranthene(FLT)				
Naphthalene(NAP)	91-20-3	mg/kg	0.1	ND
Sum of 15 PAHs	-	mg/kg	-	ND
Material Category	-	-	-	-

#### Notes:

## AfPS (German commission for Product Safety): PAHs requirements

	Category 1	Catego	ory 2	Category 3	
	Materials intended to be placed in the mouth, or materials coming into long-term contact with skin (more than 30s)	category 1, coming into long- term contact (more than 30s) or short-term repetitive contact <sup>c</sup> with skin during the intended or foreseeable use <sup>d</sup> .		Materials covered neither by category 1 nor by category 2, coming into short-term contact (up to 30s) with skin during the intended or foreseeable use.	
Parameter	during the intended use -in toys according to Directive 2009/48/EC or -for the use by children <sup>a,b</sup> up to 3 years of age.	a. use by children	b. other consumer products	a. use by children	b. other consumer products
Benzo(a)pyrene (BaP) mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(e)pyrene (BeP) mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(a)anthracene (BaA) mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(b)fluoranthene (BbF) mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(j)fluoranthene (BjF) mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(k)fluoranthene (BkF)mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1



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Chrysene (CHR) mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Dibenzo(a,h)anthracen e (DBA) mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo(g,h,i)perylene (BPE) mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Indeno(1,2,3-cd)pyrene (IPY) mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Phenanthrene (PHE), pyrene (PYR), anthracene (ANT), fluoranthene (FLT), mg/kg	< 1 Sum	< 5 Sum	< 10 Sum	< 20 Sum	< 50 Sum
Naphthalene (NAP) mg/kg	< 1	< 2		< 10	
Sum of 15 PAHs	<1	< 5	< 10	< 20	< 50

#### Notes:

#### Remark:

The German committee on Product Safety (AfPS) published a new PAHs document (AfPS GS 2019:01 PAK) on April 10, 2020, which will be binding for the issue of GS mark certificate from July 1,

Unless otherwise stated, the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule (w=0) stated in ILAC-G8:09/2019.



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<sup>&</sup>lt;sup>a</sup> A "Child" is legally defined as a person before reaching the age of 14 years.

<sup>&</sup>lt;sup>b</sup> Use by children includes both active and passive contact by children.

<sup>&</sup>lt;sup>c</sup> Definition "short-term repetitive contact" taken from REACH Annex XVII entry 50 amendment (Regulation (EC) No.1272/2013)

<sup>&</sup>lt;sup>d</sup> According to the definition of the German Product Safety Act (ProdSG) (chapter 1 Article 2 No. 28)

<sup>&</sup>quot;foreseeable use" shall mean the use of a product in a manner that the person placing it on the market, has not intended, but which could be reasonably foreseeable.



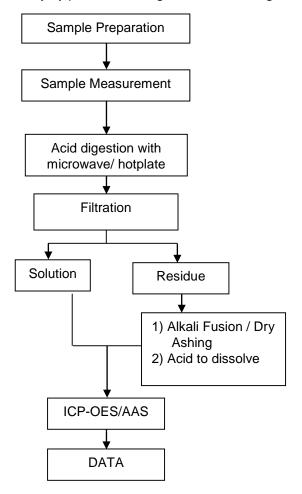
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## **Elements Testing Flow Chart**

These samples were dissolved totally by pre-conditioning method according to below flow chart.





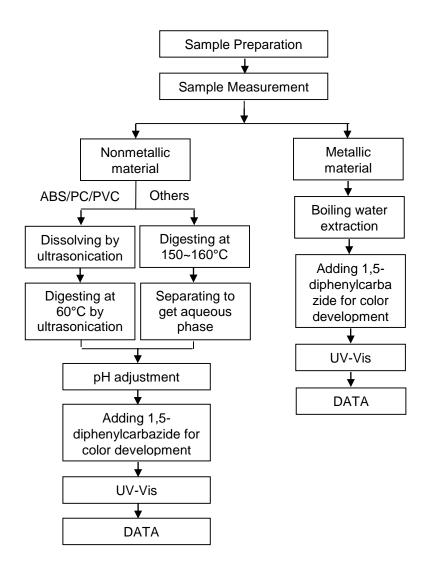
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# Hexavalent Chromium (Cr(VI)) Testing Flow Chart





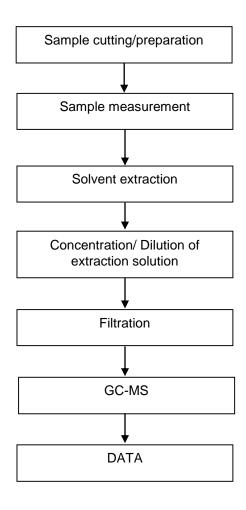
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#### PBBs/PBDEs Testing Flow Chart





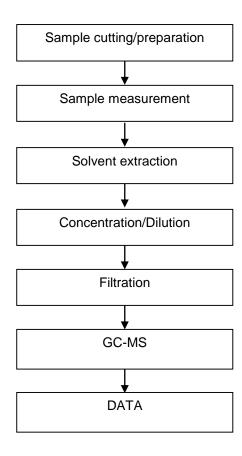
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## **Phthalates Testing Flow Chart**





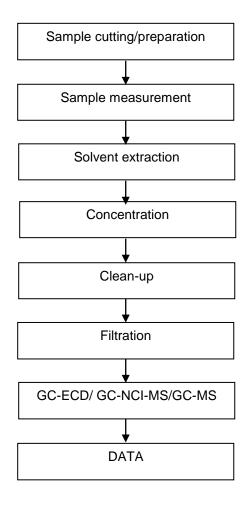
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# **Chlorinated Paraffin Testing Flow Chart**





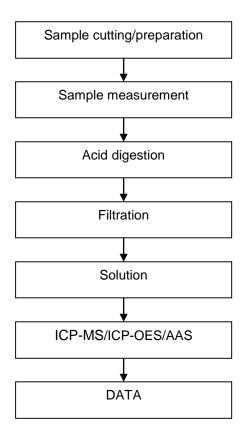
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# **Elements Testing Flow Chart**





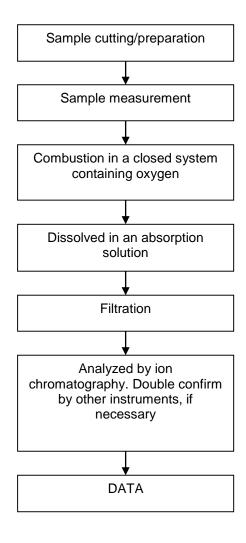
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# **Halogen Testing Flow Chart**





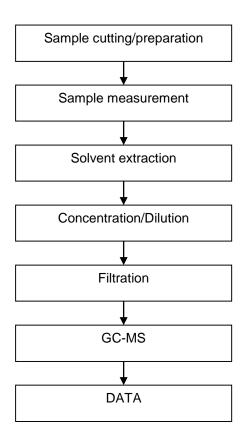
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# **HBCDD Testing Flow Chart**





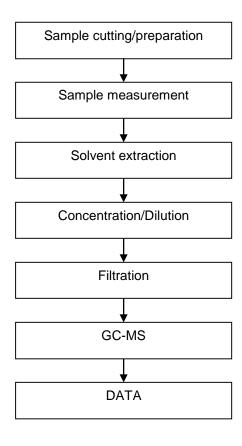
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# **PCB Testing Flow Chart**





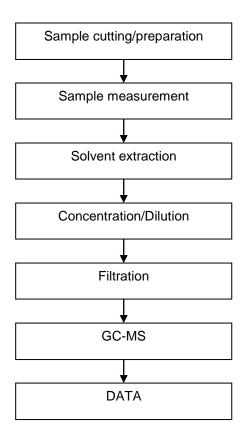
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# **PCN Testing Flow Chart**





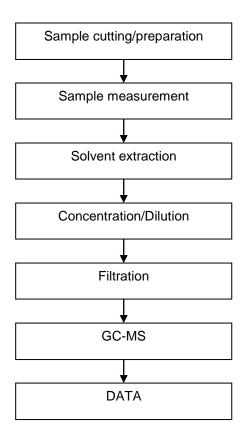
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# **PCT Testing Flow Chart**





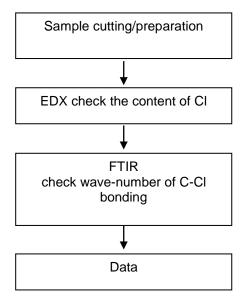
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# **PVC Testing Flow Chart**





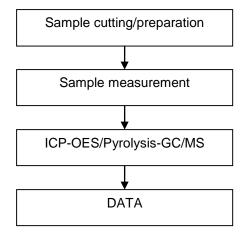
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# **Red Phosphorus Testing Flow Chart**





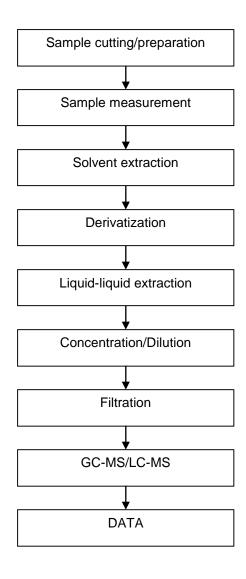
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# **TBBP-A Testing Flow Chart**





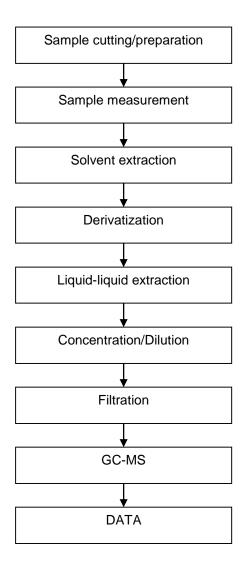
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# **Organotin Testing Flow Chart**





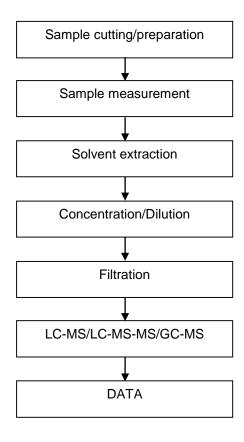
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# PFASs/ PFOS/PFOA Testing Flow Chart





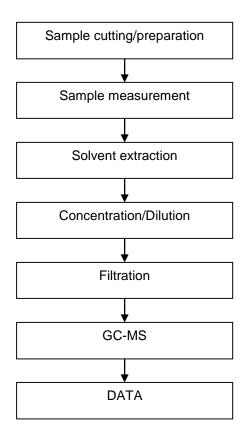
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# **PAHs Testing Flow Chart**





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