

Test Report

No.: CANEC23015607333

Date: Dec 14, 2023

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Client Name: KINGBOARD LAMINATES HOLDINGS LIMITED

Client Address: 23/F., DELTA HOUSE, NO.3 ON YIU STREET, SHATIN, N.T. HONG KONG.

Sample Name: KB-6164

Model No.: KB-6164

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

SGS Job No.: GZP23-018754

Sample Receiving Date: Dec 04, 2023

Testing Period: Dec 04, 2023 ~ Dec 13, 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).

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
Tetrabromobisphenol A (TBBP-A)	See Results
Alkanes C14-C17, chloro (medium- chain chlorinated paraffins) (MCCPs)	See Results
AfPS GS 2019:01 PAK-Polycyclic Aromatic Hydrocarbons (PAHs)	See Results
Persistent, Bioaccumulative, and Toxic (PBT) Chemicals under US EPA Toxic Substances Control Act (TSCA) Section 6(h)	Pass
Element(s)	See Results
Red Phosphorus	See Results
Polychlorinated Biphenyls (PCBs)	See Results

Signed for and on behalf of
SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch

Jany Zhong

Jany Zhong
Approved Signatory

scan to see the report



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Test Requirement	Conclusion
Benzotriazole UV Absorbent	See Results
Bisphenol-A	See Results
Chlorinated Paraffins	See Results
Formaldehyde	See Results
Hexabromocyclododecane (HBCDD)	See Results
Organic-Tin compounds	See Results
Phthalates	See Results
Polyvinyl chloride (PVC)	See Results

Test Result(s):

Test Part Description:

SN ID	Sample No.	SGS Sample ID	Description
SN1	A5	CAN23-0156073-0001.C005	Double-side copper-clad laminate

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)

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	A5
Cadmium(Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	11
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



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Test Item(s)	Limit	Unit(s)	MDL	A5
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.

Tetrabromobisphenol A (TBBP-A)

Test Method: With reference to US EPA 3550C: 2007, analysis was performed by GC-MS or LC-MS or LC-MS/MS.

Test Item(s)	CAS No.	Unit(s)	MDL	A5
Tetrabromobisphenol A(TBBP-A)	79-94-7	mg/kg	5	ND

Alkanes C14-C17, chloro (medium- chain chlorinated paraffins) (MCCPs)

Test Method: With reference to ISO 22818:2021, analysis was performed by GC-NCI-MS.

Test Item(s)	CAS No.	Unit(s)	MDL	A5
Alkanes C ₁₄ -C ₁₇ , chloro (medium- chain chlorinated paraffins) (MCCPs)	85535-85-9 and others	mg/kg	50	ND

AfPS GS 2019:01 PAK-Polycyclic Aromatic Hydrocarbons (PAHs)

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

Test Item(s)	CAS No.	Unit(s)	MDL	A5
Benzo(a)pyrene(BaP)	50-32-8	mg/kg	0.1	ND
Benzo(e)pyrene(BeP)	192-97-2	mg/kg	0.1	ND



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中国·广东·广州高新技术产业开发区科学城科珠路198号 邮编: 510663

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Test Item(s)	CAS No.	Unit(s)	MDL	A5
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
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), Fluoranthene(FLT)	-	mg/kg	-	ND
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

Parameter	Category 1	Category 2		Category 3	
	Materials intended to be placed in the mouth, or materials coming into long-term contact with skin (more than 30s) during the intended use -in toys according to Directive 2009/48/EC or -for the use by children ^{a,b} up to 3 years of age.	Materials not covered by category 1, coming into long-term contact (more than 30s) or short-term repetitive contact ^c with skin during the intended or foreseeable use ^d .		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.	
		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



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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
Chrysene (CHR) mg/kg	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Dibenzo(a,h)anthracene (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:

- ^a A "Child" is legally defined as a person before reaching the age of 14 years.
- ^b Use by children includes both active and passive contact by children.
- ^c Definition "short-term repetitive contact" taken from REACH Annex XVII entry 50 amendment (Regulation (EC) No.1272/2013)
- ^d According to the definition of the German Product Safety Act (ProdSG) (chapter 1 Article 2 No. 28) "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.

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, 2020.

Persistent, Bioaccumulative, and Toxic (PBT) Chemicals under US EPA Toxic Substances Control Act (TSCA) Section 6(h)

Test Method: SGS In-house method (SGS-CCL-TOP-149-07, With reference to US EPA Method 3550C:2007), analysis was performed by GC-MS.

Test Item(s)	CAS No.	Limit	Unit(s)	MDL	A5
Decabromodiphenyl ether (DecaBDE) ^{Δ1}	1163-19-5	Prohibited	mg/kg	5	ND



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Test Item(s)	CAS No.	Limit	Unit(s)	MDL	A5
Phenol, isopropylated phosphate (3:1) (PIP 3:1) ^{Δ2}	68937-41-7	Prohibited	mg/kg	5	ND
2,4,6-Tris(tert-butyl)phenol (2,4,6-TTBP) ^{Δ3}	732-26-3	3000	mg/kg	5	ND
Hexachlorobutadiene (HCBd)	87-68-3	Prohibited	mg/kg	5	ND
Pentachlorothiophenol (PCTP)	133-49-3	10000	mg/kg	5	ND
Conclusion					Pass

Notes:

(1) The regulation is available at the following link.

<https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/persistent-bioaccumulative-and-toxic-pbt-chemicals-under>

(2) ^{Δ1}: The submitted sample is exempted if it is plastic for recycling from products or articles containing Deca-BDE.

(3) ^{Δ2}: The submitted sample is exempted from the regulated scope if it is anyone of the following:

- Hydraulic fluids for aviation or military industry;
- Lubricants and grease;
- New and replacement parts for motor and aerospace vehicles;
- Intermediate in a closed system to produce cyanoacrylate adhesive;
- Specialized engine air filters for locomotive and marine applications;
- Plastic for recycling from products or articles containing PIP (3:1);
- Finished products or articles made of plastic recycled from products or articles containing PIP (3:1).

(4) ^{Δ3}: The submitted sample is out of the regulated scope if it is not oil or lubricant.

Element(s)

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

Test Item(s)	Unit(s)	MDL	A5
Beryllium(Be)	mg/kg	5	ND
Nickel (Ni)	mg/kg	5	ND
Antimony(Sb)	mg/kg	10	ND

Red Phosphorus

Test Method: SGS In-house method (SGS-CCL-TOP-215-01), analysis was performed by PY-GC/MS/ICP-OES / GC-MS.

Test Item(s)	CAS No.	Unit(s)	MDL	A5
Red Phosphorus	7723-14-0	mg/kg	500	ND

Polychlorinated Biphenyls (PCBs)

Test Method: SGS In-house method (GZTC CHEM-TOP-032-01, with reference to EPA 8082A:2007), analysis was performed by GC-ECD/GC-MS.

Test Item(s)	CAS No.	Unit(s)	MDL	A5
2,4,4'-Trichlorobiphenyl(PCB28)	7012-37-5	mg/kg	0.5	ND



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Test Item(s)	CAS No.	Unit(s)	MDL	A5
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

Benzotriazole UV Absorbent

Test Method: SGS In-house method(GZTC CHEM-TOP-102, with reference to EPA 3550C:2007), analysis was performed by GC-MS.

Test Item(s)	CAS No.	Unit(s)	MDL	A5
2-Benzotriazol-2-yl-4,6-di-tert-butylphenol(UV 320)	3846-71-7	mg/kg	5	ND
2-(2H-Benzotriazol-2-yl)-4(tert-butyl)-6-(sec-butyl)phenol (UV 350)	36437-37-3	mg/kg	5	ND
2-(2H-Benzotriazol-2-yl)-4,6-di-tert-pentylphenol(UV 328)	25973-55-1	mg/kg	5	ND
2,4-Di-tert-butyl-6-(5-chlorobenzotriazol-2-yl)phenol (UV 327)	3864-99-1	mg/kg	5	ND

Bisphenol-A

Test Method: SGS In-house method (GZTC CHEM-TOP-075-02, With reference to EPA 3550C:2007 & EPA 8321B:2007), analysis was performed by LC-MS.

Test Item(s)	CAS No.	Unit(s)	MDL	A5
Bisphenol-A	80-05-7	mg/kg	1.0	ND

Chlorinated Paraffins

Test Method: With reference to ISO 22818:2021, analysis was performed by GC-NCI-MS.

Test Item(s)	CAS No.	Unit(s)	MDL	A5
Short Chain Chlorinate Paraffins(SCCP)(C ₁₀ -C ₁₃)	85535-84-8	mg/kg	50	ND

Formaldehyde

Test Method: With reference to ISO 14184-1:2011, analysis was performed by UV-Vis.

Test Item(s)	Unit(s)	MDL	A5
Formaldehyde	mg/kg	16	ND

Hexabromocyclododecane (HBCDD)



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

Test Item(s)	CAS No.	Unit(s)	MDL	A5
Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α -HBCDD, β -HBCDD, γ -HBCDD)	134237-50-6 /134237-51-7 /134237-52-8 /25637-99-4 /3194-55-6	mg/kg	20	ND

Organic-Tin compounds

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

Test Item(s)	Unit(s)	MDL	A5
Dibutyl tin(DBT)	mg/kg	0.02	ND
Tributyl tin(TBT)	mg/kg	0.02	ND
Diocetyl tin(DOT)	mg/kg	0.02	ND
Triphenyl tin(TPhT)	mg/kg	0.02	ND
Tricyclohexyltin(TCyHT)	mg/kg	0.02	ND
Trimethyltin(TMT)	mg/kg	0.02	ND
Triocetyl tin(TOT)	mg/kg	0.02	ND
Tri-n-propyltin(TPT)	mg/kg	0.02	ND

Phthalates

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

Test Item(s)	CAS No.	Unit(s)	MDL	A5
Dibutyl Phthalate(DBP)	84-74-2	mg/kg	50	ND
Bis-(2-ethylhexyl) Phthalate(DEHP)	117-81-7	mg/kg	50	ND
Benzyl Butyl Phthalate(BBP)	85-68-7	mg/kg	50	ND
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
Diisobutyl Phthalate(DIBP)	84-69-5	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 (DPENP/DnPP)	131-18-0	mg/kg	50	ND
Diphenyl Phthalate(DPhP)	84-62-8	mg/kg	50	ND
Diundecyl Phthalate(DUDP)	3648-20-2	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
Dinonyl Phthalate(DNP)	84-76-4	mg/kg	50	ND
Diisooctyl Phthalate(DIOP)	27554-26-3	mg/kg	50	ND



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Test Item(s)	CAS No.	Unit(s)	MDL	A5
Diallyl Phthalate(DAP)	131-17-9	mg/kg	50	ND
n-Decyl-n-Octyl Phthalate(nDnOP)	119-07-3	mg/kg	50	ND
Di-n-Decyl Phthalate(DnDP)	84-77-5	mg/kg	50	ND
Diisopentyl Phthalate(DIPP)	605-50-5	mg/kg	50	ND
n-pentyl Isopentyl Phthalate(nPIPP)	776297-69-9	mg/kg	50	ND
Bis(2-n-butoxyethyl)Phthalate(DBEP)	117-83-9	mg/kg	50	ND
Bis(4-methyl-2-pentyl)Phthalate(BMPP)	146-50-9	mg/kg	50	ND
Bis(2-ethoxyethyl)Phthalate(DEEP)	605-54-9	mg/kg	50	ND
1,2-Benzenedicarboxylic Acid,di-C6-8-branched alkyl esters,C7-rich(DIHP)	71888-89-6	mg/kg	50	ND
Di-n-Heptyl Phthalate(DnHpP)	3648-21-3	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,Dipentyl Ester,Branched and Linear (DPP)	84777-06-0	mg/kg	50	ND
Ditridecyl Phthalate(DTDP)	119-06-2	mg/kg	50	ND
1,2-benzenedicarboxylic Acid,dihexyl ester branched and linear(DHxP)	68515-50-4	mg/kg	50	ND
Di-(2-Ethylhexyl)Adipate(DEHA)	103-23-1	mg/kg	50	ND
Di-octyl Terephthalate(DOTP)	6422-86-2	mg/kg	50	ND
Diisononyl Adipate(DINA)	33703-08-1	mg/kg	50	ND
Di(2-propylheptyl)Phthalate(DPHpP)	53306-54-0	mg/kg	50	ND
Acetyl Tributyl Citrate(ATBC)	77-90-7	mg/kg	50	ND
Tri-octyl trimellitate(TOTM)	3319-31-1	mg/kg	50	ND

Polyvinyl chloride (PVC)

Test Method: SGS In-house method (SGS-CCL-TOP-066-01), analysis was performed by FTIR/HATR.

Test Item(s)	A5
Polyvinyl chloride (PVC)	Negative

Notes:

(1) Negative=Undetectable, Positive=Detectable

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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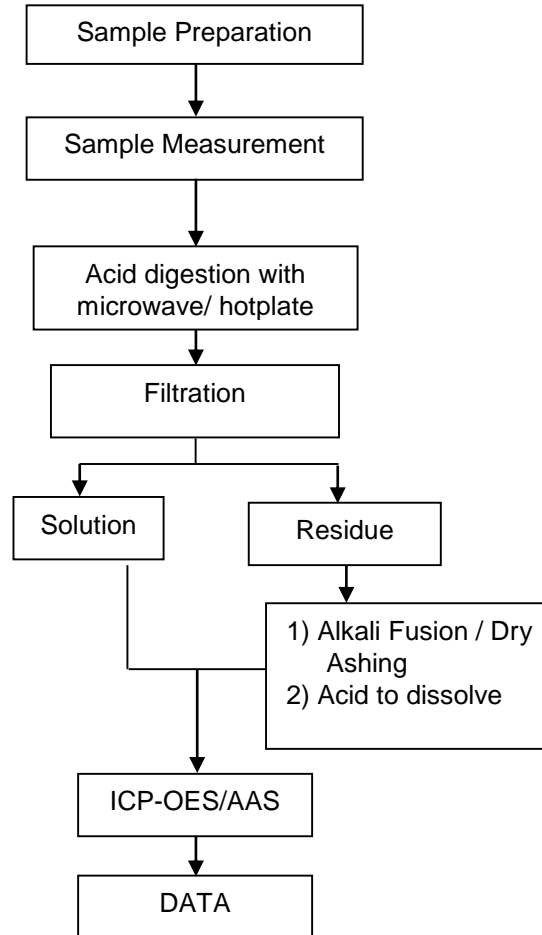
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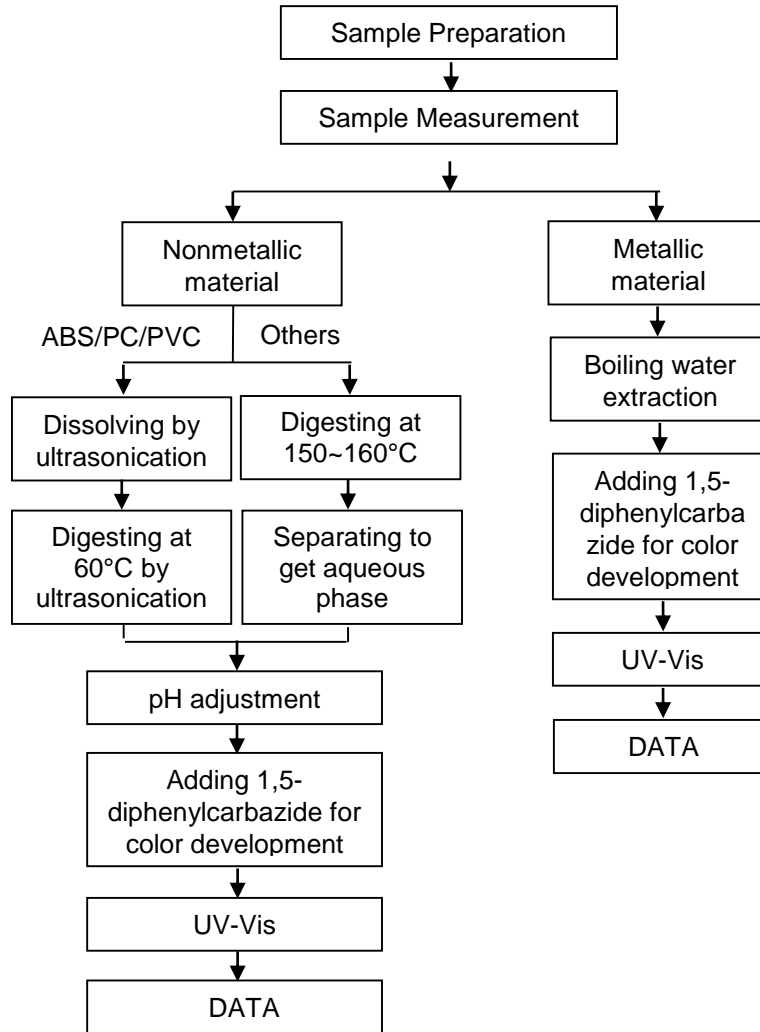
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Elements Testing Flow Chart

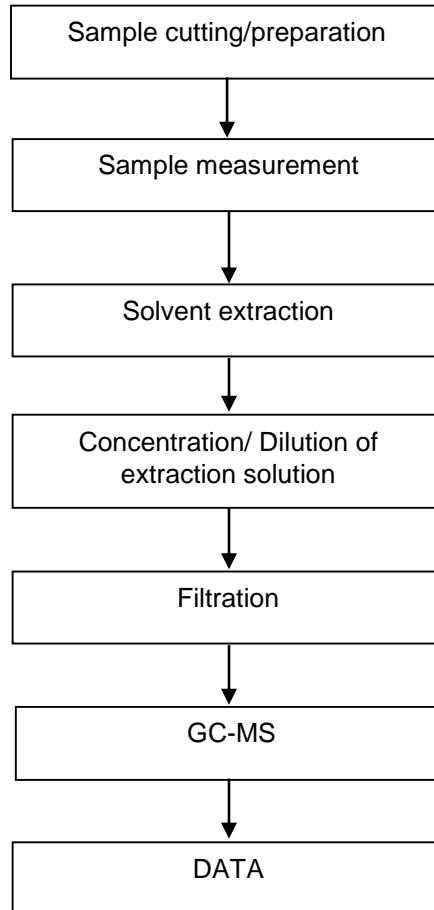
These samples were dissolved totally by pre-conditioning method according to below flow chart.



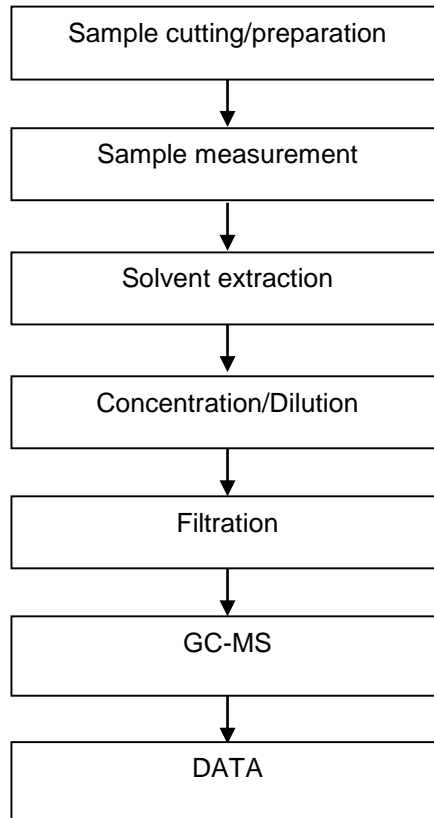
Hexavalent Chromium (Cr(VI)) Testing Flow Chart



PBBs/PBDEs Testing Flow Chart

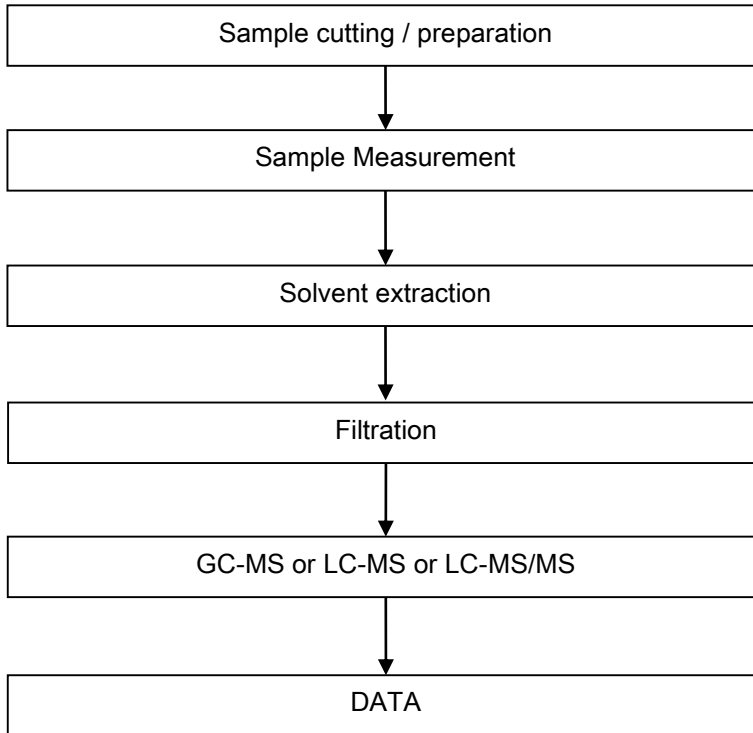


Phthalates Testing Flow Chart

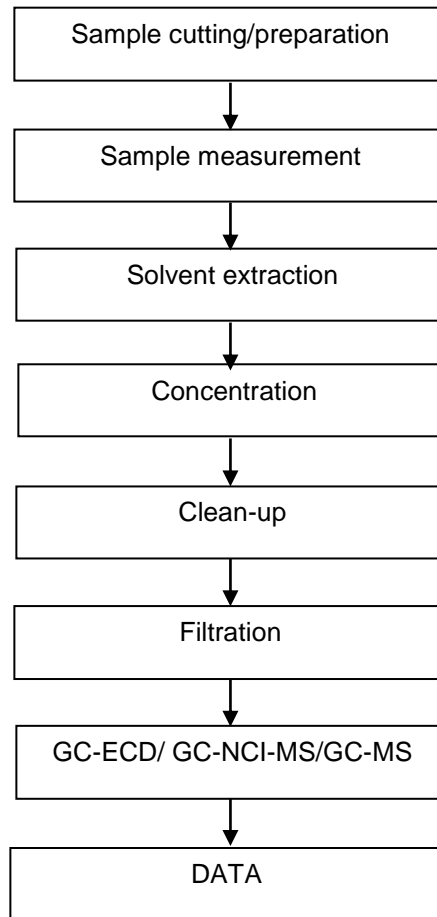


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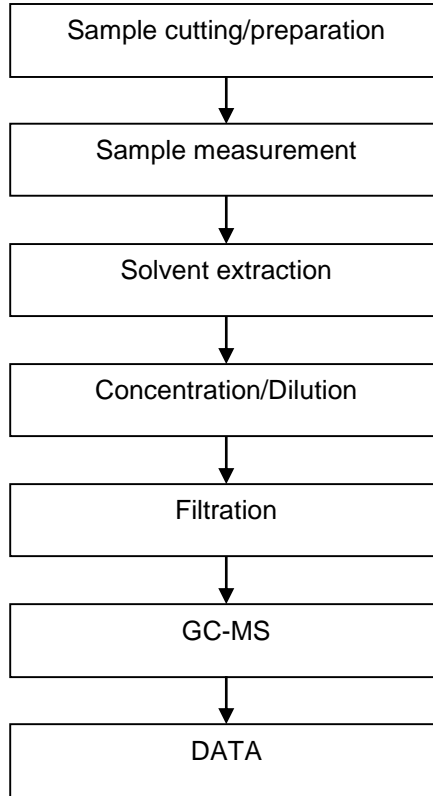
TBBP-A Testing Flow Chart



Chlorinated Paraffin Testing Flow Chart

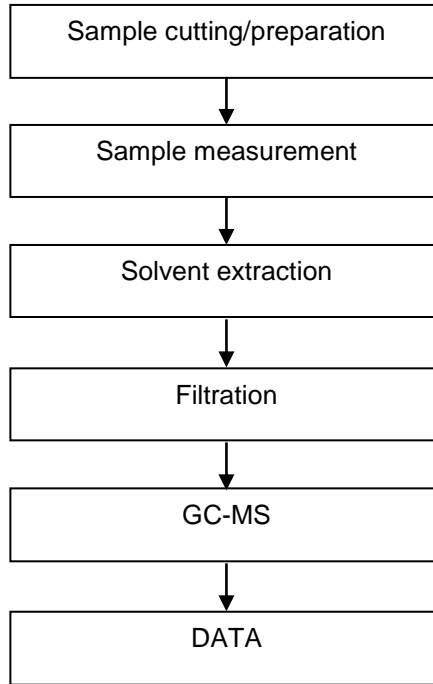


PAHs Testing Flow Chart



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Persistent, Bioaccumulative, and Toxic (PBT) Chemicals Testing Flow Chart



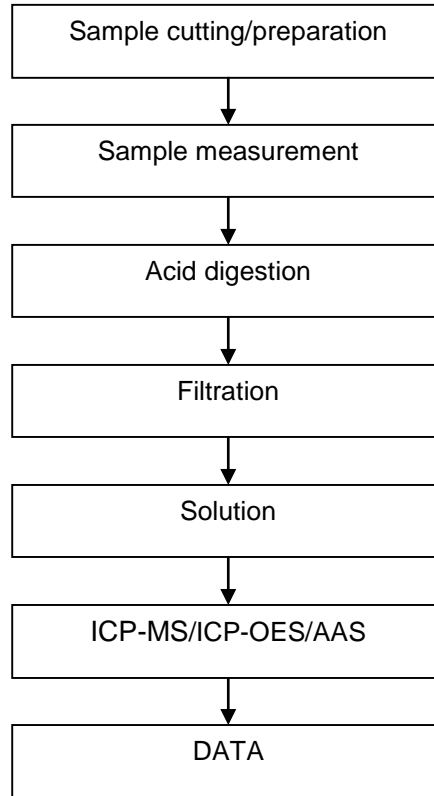
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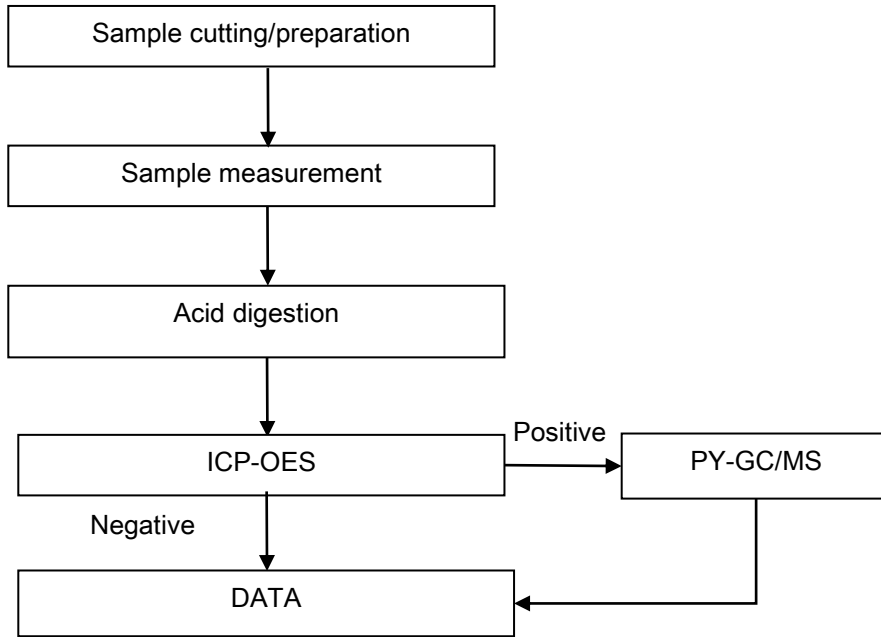
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Elements Testing Flow Chart



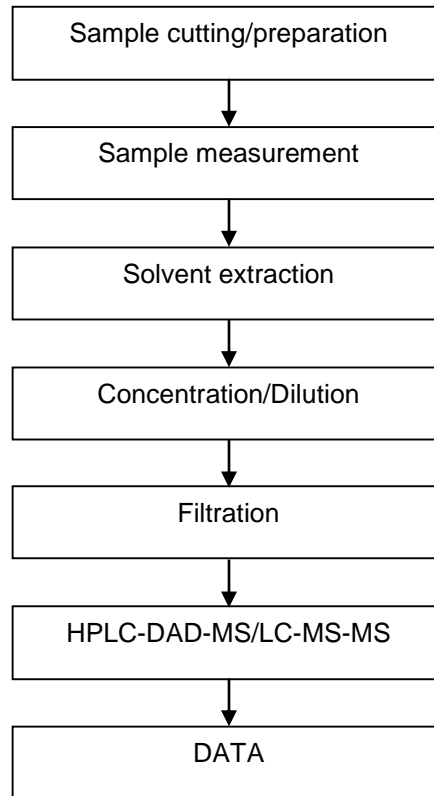
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Red phosphorus Testing Flow Chart

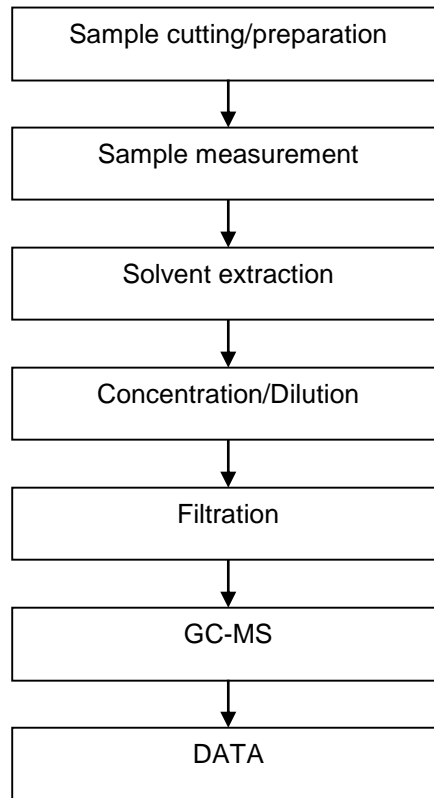


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BPA Testing Flow Chart

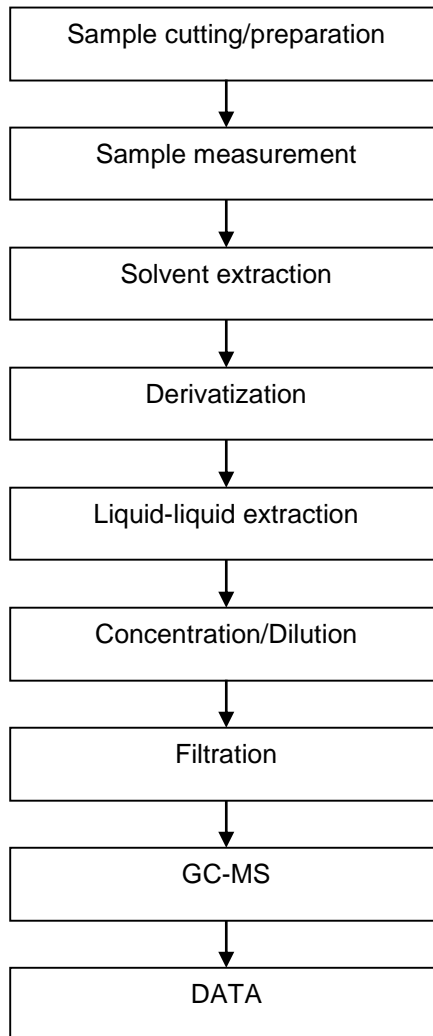


HBCDD Testing Flow Chart



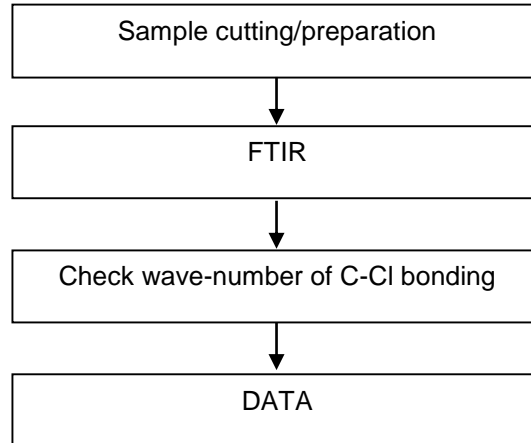
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Organotin Testing Flow Chart



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PVC Testing Flow Chart



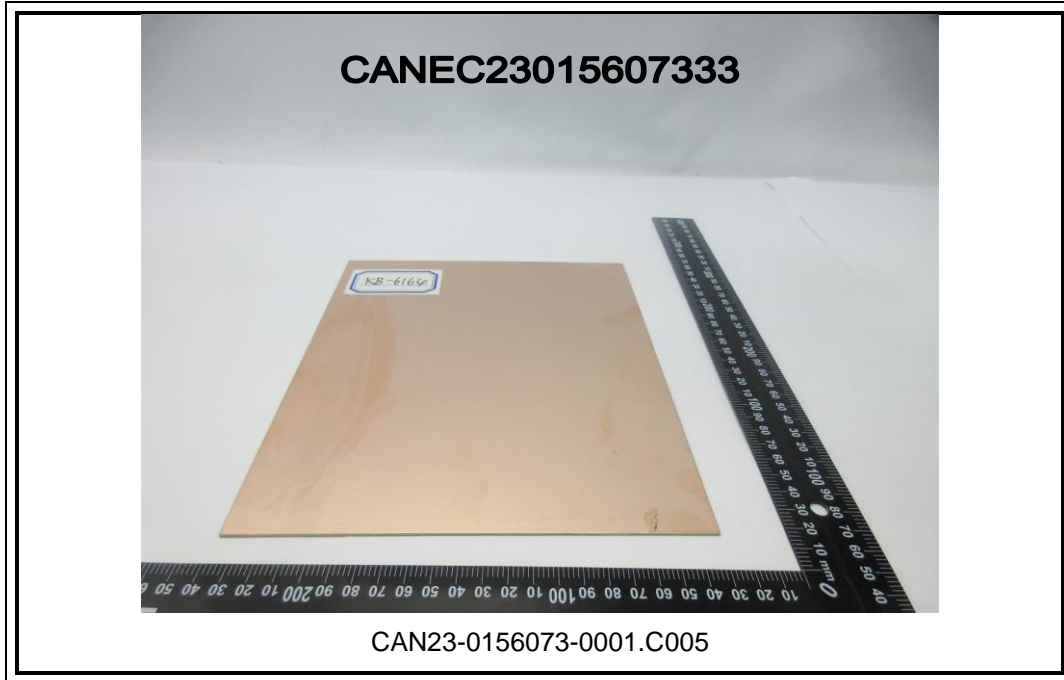
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