

# Test Report

No. CANEC2116975901

Date: 24 Sep 2021

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KINGBOARD LAMINATES HOLDINGS LIMITED

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

The following sample(s) was/were submitted and identified on behalf of the clients as : HF-140

SGS Job No. : CP21-049075 - GZ  
 Model No. : HF-140  
 Date of Sample Received : 09 Sep 2021  
 Testing Period : 09 Sep 2021 - 24 Sep 2021  
 Test Requested : Selected test(s) as requested by client.  
 Test Method : Please refer to next page(s).  
 Test Results : Please refer to next page(s).

### Result Summary :

Test Requested	Conclusion
RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU	PASS
Halogen	See Results
Elementary Analysis	See Results
Tetrabromobisphenol A (TBBP-A)	See Results
Red Phosphor	See Results
Phthalate	See Results
Formaldehyde	See Results
Hexabromocyclododecane (HBCDD)	See Results
Perfluorooctanoic acid (PFOA) and its salts & Perfluorooctane sulfonates (PFOS) and its derivatives	See Results
Organic-tin compounds	See Results
European Regulation POPs (EU) 2019/1021 – Alkanes C10-C13, chloro (short-chain chlorinated paraffins) (SCCPs)	PASS
Persistent, Bioaccumulative, and Toxic (PBT) Chemicals under US EPA Toxic Substances Control Act (TSCA) Section 6(h)	PASS
Benzotriazole UV Absorbant	See Results



SGS-CSTC Standards Technical Services Co., Ltd.  
 Guangzhou Branch Testing Center Chemical Laboratory.

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

Jessie Li

Jessie Li  
Approved Signatory

scan to see the report



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Test Results :

### Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	CAN21-169759.001	Double-side copper-clad laminate

Remarks :

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

### RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU

Test Method : With reference to IEC 62321-4:2013+A1:2017, IEC 62321-5:2013, IEC 62321-7-2:2017, IEC 62321-6:2015 and IEC 62321-8:2017, analyzed by ICP-OES, UV-Vis and GC-MS.

Test Item(s)	Limit	Unit	MDL	001
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1000	mg/kg	2	13
Mercury (Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (CrVI)	1000	mg/kg	8	ND
Sum of PBBs	1000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	-	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	-	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	-	mg/kg	5	ND
Sum of PBDEs	1000	mg/kg	-	ND
Monobromodiphenyl ether	-	mg/kg	5	ND
Dibromodiphenyl ether	-	mg/kg	5	ND
Tribromodiphenyl ether	-	mg/kg	5	ND
Tetrabromodiphenyl ether	-	mg/kg	5	ND
Pentabromodiphenyl ether	-	mg/kg	5	ND
Hexabromodiphenyl ether	-	mg/kg	5	ND
Heptabromodiphenyl ether	-	mg/kg	5	ND



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<u>Test Item(s)</u>	<u>Limit</u>	<u>Unit</u>	<u>MDL</u>	<u>001</u>
Octabromodiphenyl ether	-	mg/kg	5	ND
Nonabromodiphenyl ether	-	mg/kg	5	ND
Decabromodiphenyl ether	-	mg/kg	5	ND
Dibutyl phthalate (DBP)	1000	mg/kg	50	ND
Butyl benzyl phthalate (BBP)	1000	mg/kg	50	ND
Bis (2-ethylhexyl) phthalate (DEHP)	1000	mg/kg	50	ND
Diisobutyl Phthalates (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

[https://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP\\_ORG\\_ID,FSP\\_LANG\\_ID:1258637,25](https://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25)

(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.

### Halogen

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

<u>Test Item(s)</u>	<u>Unit</u>	<u>MDL</u>	<u>001</u>
Fluorine (F)	mg/kg	50	1106
Chlorine (Cl)	mg/kg	50	220
Bromine (Br)	mg/kg	50	ND
Iodine (I)	mg/kg	50	ND

### Elementary Analysis

Test Method : SGS In-house method (GZTC CHEM-TOP-004-01, with reference to EPA 3052:1996), analysis was performed by ICP-OES.

<u>Test Item(s)</u>	<u>Unit</u>	<u>MDL</u>	<u>001</u>
Arsenic (As)	mg/kg	10	ND
Antimony (Sb)	mg/kg	10	ND
Beryllium (Be)	mg/kg	5	ND

### Tetrabromobisphenol A (TBBP-A)



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Test Method : SGS In-house method (GZTC CHEM-TOP-065, With reference to EPA 3540C:1996 & EPA 8270E:2017), analysis was performed by LC-MS/MS.

<u>Test Item(s)</u>	<u>Unit</u>	<u>MDL</u>	<u>001</u>
Tetrabromobisphenol A (TBBP-A)	mg/kg	5	ND

## Red Phosphor

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

<u>Test Item(s)</u>	<u>Unit</u>	<u>MDL</u>	<u>001</u>
Red phosphorus	mg/kg	500	ND

## Phthalate

Test Method : With reference to EN14372: 2004. Analysis was performed by GC-MS.

<u>Test Item(s)</u>	<u>CAS NO.</u>	<u>Unit</u>	<u>MDL</u>	<u>001</u>
Dibutyl Phthalate (DBP)	84-74-2	%(w/w)	0.003	ND
Benzylbutyl Phthalate (BBP)	85-68-7	%(w/w)	0.003	ND
Bis(2-ethylhexyl) Phthalate (DEHP)	117-81-7	%(w/w)	0.003	ND
Diisononyl Phthalate (DINP)	28553-12-0 / 68515-48-0	%(w/w)	0.010	ND
Di-n-octyl Phthalate (DNOP)	117-84-0	%(w/w)	0.003	ND
Diisodecyl Phthalate (DIDP)	26761-40-0 / 68515-49-1	%(w/w)	0.010	ND
Dimethyl Phthalate (DMP)	131-11-3	%(w/w)	0.003	ND
Diethyl Phthalate (DEP)	84-66-2	%(w/w)	0.003	ND
Dipropyl Phthalate (DPrP)	131-16-8	%(w/w)	0.003	ND
Diisobutyl Phthalate (DIBP)	84-69-5	%(w/w)	0.003	ND
Dipentyl Phthalates (DPENP/DnPP)	131-18-0	%(w/w)	0.003	ND
Di-n-hexyl Phthalate (DnHP)	84-75-3	%(w/w)	0.003	ND
Dicyclohexyl Phthalate (DCHP)	84-61-7	%(w/w)	0.003	ND
Diphenyl Phthalate (DPhP)	84-62-8	%(w/w)	0.003	ND
Dibenzyl Phthalate (DBzP)	523-31-9	%(w/w)	0.003	ND
Dinonyl Phthalate (DNP)	84-76-4	%(w/w)	0.003	ND
Diisooctyl Phthalate (DIOP)	27554-26-3	%(w/w)	0.010	ND
Bis(2-methoxyethyl) Phthalate (DMEP)	117-82-8	%(w/w)	0.003	ND



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Test Item(s)	CAS NO.	Unit	MDL	001
Diallyl Phthalate (DAP)	131-17-9	%(w/w)	0.003	ND
n-decyl, n-octyl Phthalate (nDnOP)	119-07-3	%(w/w)	0.003	ND
Di-n-decyl Phthalate (DnDP)	84-77-5	%(w/w)	0.003	ND
Diisopentyl Phthalate (DIPP)	605-50-5	%(w/w)	0.003	ND
n-pentyl Isopentyl Phthalate (nPIPP)	776297-69-9	%(w/w)	0.003	ND
1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich (DIHP)	71888-89-6	%(w/w)	0.010	ND
1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters (DHNUP)	68515-42-4	%(w/w)	0.010	ND
Di(2-ethylhexyl)adipate (DEHA)	103-23-1	%(w/w)	0.003	ND
Bis(4-methyl-2-pentyl) Phthalate (BMPP)	146-50-9	%(w/w)	0.003	ND
Bis(2-ethoxyethyl) Phthalate (DEEP)	605-54-9	%(w/w)	0.003	ND
Bis(2-n-butoxyethyl) Phthalate (DBEP)	117-83-9	%(w/w)	0.003	ND
Diundecyl Phthalate (DUDP)	3648-20-2	%(w/w)	0.003	ND
Diisononyl adipate (DINA)	33703-08-1	%(w/w)	0.010	ND
Ditridecyl Phthalate (DTDP)	119-06-2	%(w/w)	0.003	ND
Triooctyl trimellitate (TOTM)	3319-31-1	%(w/w)	0.003	ND
Diocetyl Terephthalate (DOTP)	6422-86-2	%(w/w)	0.003	ND
Di-n-heptyl Phthalate (DnHpP)	3648-21-3	%(w/w)	0.003	ND
Acetyltributylcitrate (Citroflex, ATBC)	77-90-7	%(w/w)	0.010	ND
1,2-Benzenedicarboxylic acid, dipentyl ester, branched and linear (DPP)	84777-06-0	%(w/w)	0.010	ND
1,2-Benzenedicarboxylic acid, dihexyl ester branched and linear(DHP)	68515-50-4	%(w/w)	0.010	ND
Di(2-propylheptyl) Phthalate(DPHpP)	53306-54-0	%(w/w)	0.010	ND

### Notes :

- (1) DBP,BBP,DEHP, DIBP Reference information: Entry 51 of Regulation (EU) 2018/2005 amending Annex XVII of REACH Regulation (EC) No 1907/2006:
- i) Shall not be used as substances or in mixtures, individually or in any combination of DBP, BBP, DEHP & DIBP, in concentrations equal to or greater than 0.1 % by weight of the plasticised material, in toys and childcare articles.
  - ii) Shall not be placed on the market in toys or childcare articles, individually or in any combination of DBP, BBP, DEHP, in concentrations equal to or greater than 0.1 % by weight of the plasticised material. In addition, DIBP shall not be placed on the market after 7 July 2020 in toys or childcare articles, individually or in any combination of DBP, BBP, DEHP & DIBP, in concentrations equal to or greater than 0.1 % by weight of the plasticised material.
  - iii) shall not be placed on the market after 7 July 2020 in articles, individually or in any combination of DBP, BBP, DEHP & DIBP, in concentrations equal to or greater than 0.1 % by weight of the plasticised material in the articles.
- Please refer to Regulation (EU) 2018/2005 to get more detail information
- (2) DINP, DNOP, DIDP Reference information: Entry 52 of Regulation (EU) 2015/326 amending Annex



XVII of REACH Regulation (EC) No 1907/2006.

- i) Shall not be used as substances or in mixtures, in concentrations greater than 0.1 % by weight of the plasticised material, in toys and childcare articles which can be placed in the mouth by children.
- ii) Such toys and childcare articles containing these phthalates in a concentration greater than 0.1 % by weight of the plasticised material shall not be placed on the market.

Please refer to Regulation (EU) 2015/326 to get more detail information

**Formaldehyde**

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

Test Item(s)	CAS NO.	Unit	MDL	001
Formaldehyde	50-00-0	mg/kg	16	ND

**Hexabromocyclododecane (HBCDD)**

Test Method : SGS in house method (GZTC CHEM-TOP-073, with reference to EPA 3550C:2007), analysis was performed by GC-MS.

Test Item(s)	CAS NO.	Unit	MDL	001
Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified ( $\alpha$ -HBCDD, $\beta$ -HBCDD, $\gamma$ -HBCDD)	25637-99-4	mg/kg	10	ND
	3194-55-6			
	134237-50-6			
	134237-51-7			
	134237-52-8			

**Perfluorooctanoic acid (PFOA) and its salts & Perfluorooctane sulfonates (PFOS) and its derivatives**

Test Method : With reference to CEN/TS15968:2010, analysis was performed by LC-MS or LC-MS/MS.

Test Item(s)	CAS NO.	Unit	MDL	001
Perfluorooctanoic acid (PFOA) and its salts+	335-67-1	mg/kg	0.010	ND
Perfluorooctane sulfonates (PFOS) ^	1763-23-1	mg/kg	0.010	ND
Perfluorooctane Sulfonamide (PFOSA)	754-91-6	mg/kg	0.010	ND
N-methylperfluoro-1-octanesulfonamide(MeFOSA)	31506-32-8	mg/kg	0.010	ND
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	mg/kg	0.010	ND
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol(MeFOSE)	24448-09-7	mg/kg	0.010	ND
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol(EtFOSE)	1691-99-2	mg/kg	0.010	ND
Perfluorooctane sulfonates (PFOS) and its derivatives	-	mg/kg	-	ND



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### Notes :

- (1) + PFOA and its salts including PFOA-Na (CAS No.: 335-95-5), PFOA-K (CAS No.: 2395-00-8), PFOA-Ag (CAS No.: 335-93-3), PFOA-F (CAS No.: 335-66-0) and APFO (CAS No.: 3825-26-1);  
 (2) ^ PFOS including PFOS-K (CAS No.: 2795-39-3), PFOS-Li (CAS No.: 29457-72-5), PFOS-NH<sub>4</sub> (CAS No.: 29081-56-9), PFOS-NH(OH)<sub>2</sub> (CAS No.: 70225-14-8), PFOS-N(C<sub>2</sub>H<sub>5</sub>)<sub>4</sub> (CAS No.: 56773-42-3), PFOS-DDA(CAS No.:251099-16-8) and POSF (CAS No.: 307-35-7)

### Organic-tin compounds

Test Method : SGS In-house method (GZTC CHEM-TOP-031, with reference to ISO 17353:2004), analysis was performed by GC-MS.

<u>Test Item(s)</u>	<u>Unit</u>	<u>MDL</u>	<u>001</u>
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

### European Regulation POPs (EU) 2019/1021– 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 / LC-MSMS.

<u>Test Item(s)</u>	<u>Limit</u>	<u>Unit</u>	<u>MDL</u>	<u>001</u>
Alkanes C10-C13, chloro (short-chain chlorinated paraffins) (SCCPs)	1500	mg/kg	50	ND

**Comment** **PASS**

### 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.

<u>Test Item(s)</u>	<u>CAS NO.</u>	<u>Limit</u>	<u>Unit</u>	<u>MDL</u>	<u>001</u>
Decabromodiphenyl ether (Deca-BDE)Δ <sup>1</sup>	1163-19-5	★	mg/kg	5	ND
Phenol, isopropylated phosphate (3:1) (PIP 3:1)Δ <sup>2</sup>	68937-41-7	★	mg/kg	5	ND
2,4,6-Tris(tert-butyl)phenol (2,4,6-TTBP)Δ <sup>3</sup>	732-26-3	3000	mg/kg	5	ND
Hexachlorobutadiene (HCBd)	87-68-3	★	mg/kg	5	ND
Pentachlorothiophenol (PCTP)	133-49-3	10000	mg/kg	5	ND

**Comment** **PASS**





Notes :

1. “★” = Prohibited
2. 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>
3. Δ<sup>1</sup>: The submitted sample is exempted if it is plastic for recycling from products or articles containing Deca-BDE.
4. Δ<sup>2</sup>: 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).
5. Δ<sup>3</sup>: The submitted sample is out of the regulated scope if it is not oil or lubricant.

**Benzotriazole UV Absorbant**

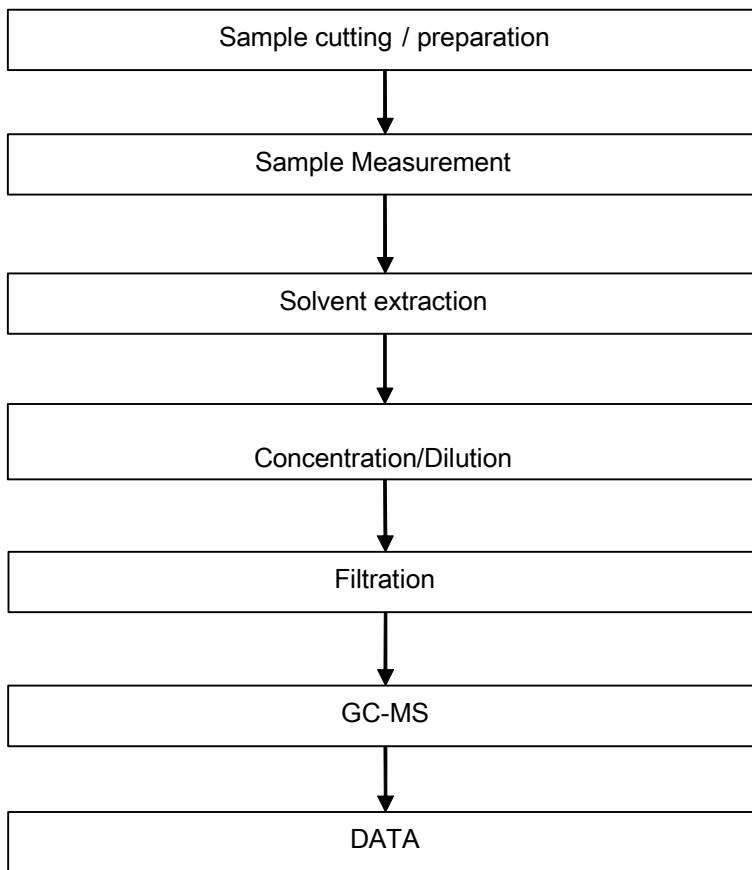
Test Method : SGS In-house method (GZTC CHEM-TOP-102, with reference to EPA 3550C:2007), analysis was performed by GC-MS.

<u>Test Item(s)</u>	<u>CAS NO.</u>	<u>Unit</u>	<u>MDL</u>	<u>001</u>
2-(3,5-Di-tert-butyl-2-hydroxyphenyl) benzotriazole (UV-320)	3846-71-7	mg/kg	5	ND
2-(3',5'-Di-tert-butyl-2'-hydroxyphenyl)-5-chloro benzotriazole	3864-99-1	mg/kg	5	ND
2-(2'-hydroxy-3',5'-di-tert-amylphenyl) benzotriazole (UV-328)	25973-55-1	mg/kg	5	ND
TinUVin 350 (UV-350)	36437-37-3	mg/kg	5	ND



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### PBBs / PBDEs Testing Flow Chart



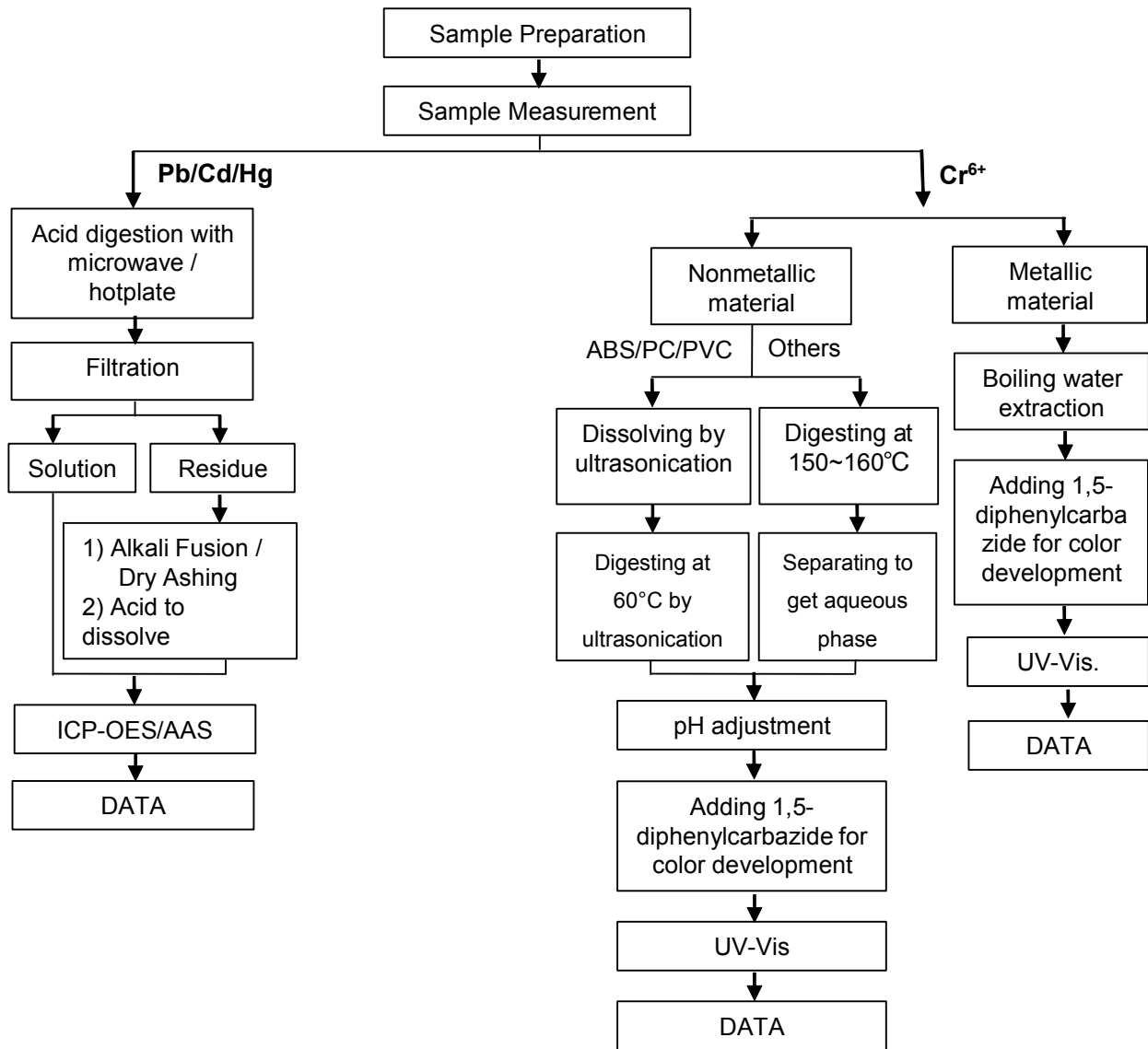
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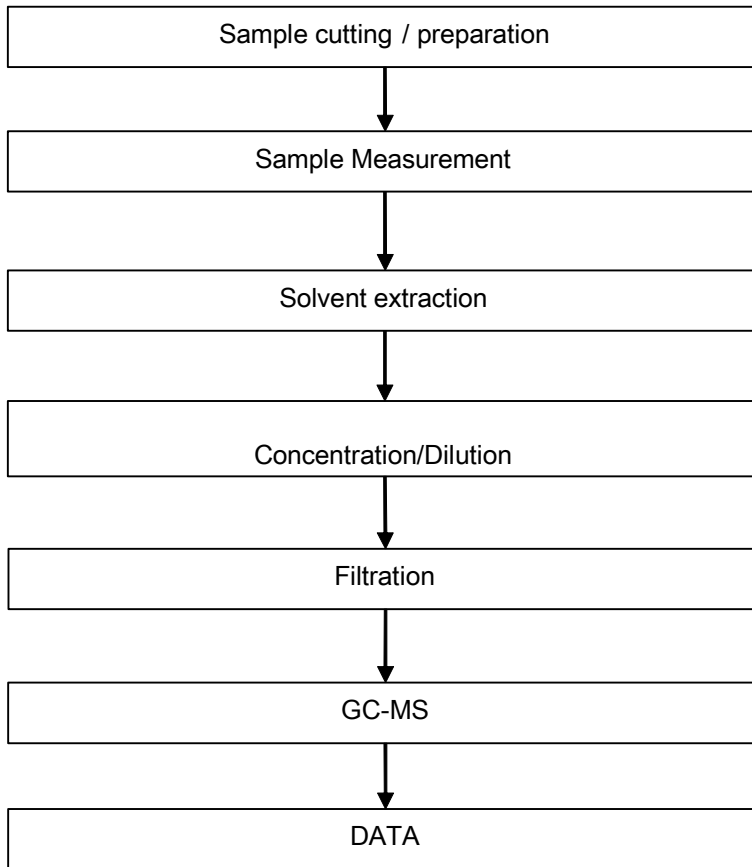
**Pb/Cd/Hg/Cr<sup>6+</sup> Testing Flow Chart**

1) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr<sup>6+</sup> test method excluded).



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### Phthalates Testing Flow Chart

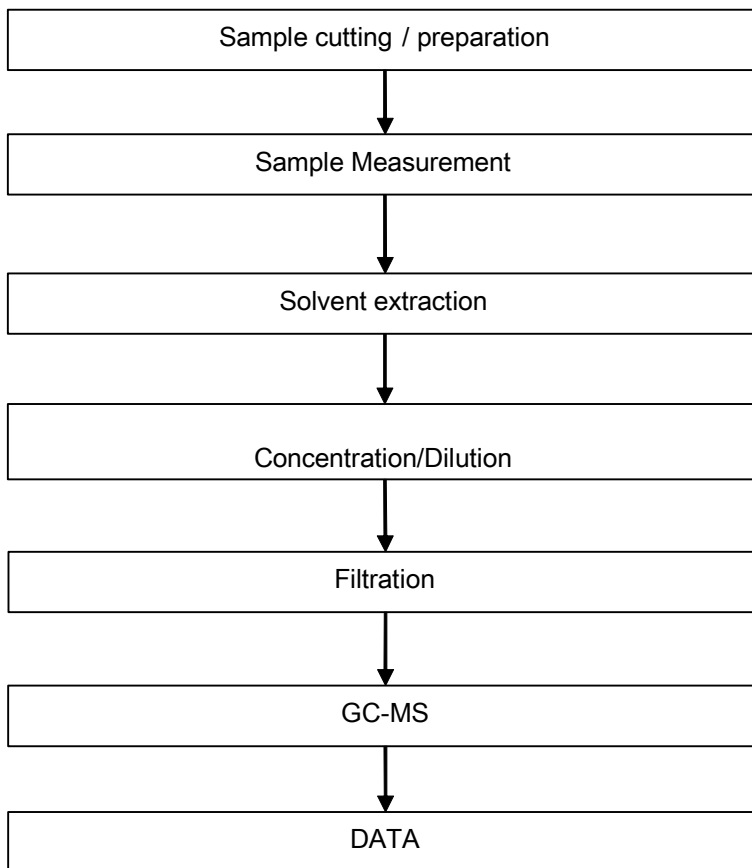


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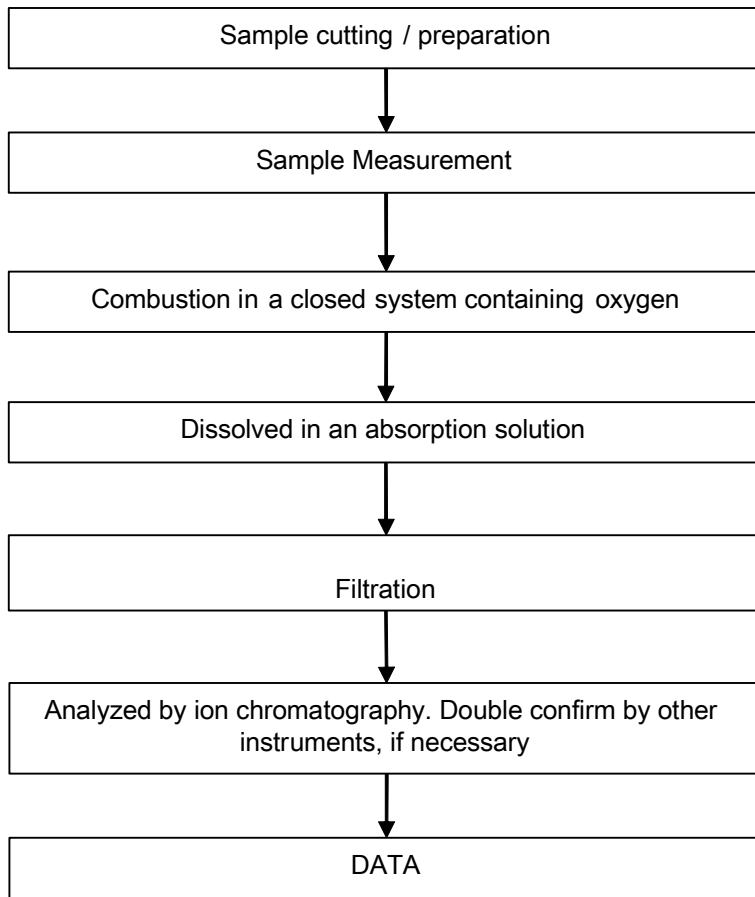
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### Phthalates Testing Flow Chart



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Halogen Testing Flow Chart

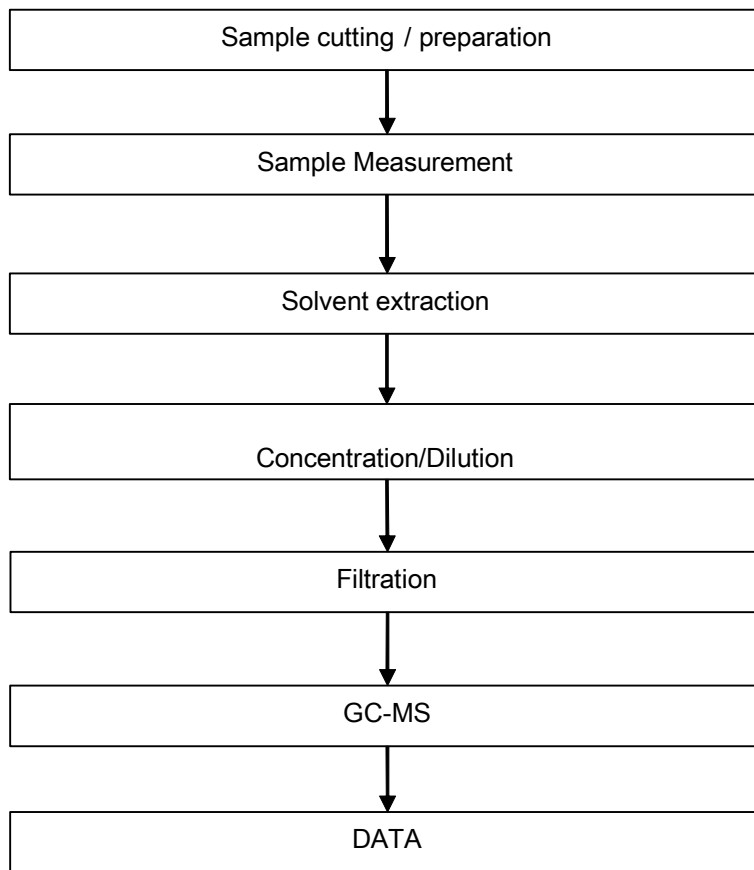


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HBCDD Testing Flow Chart

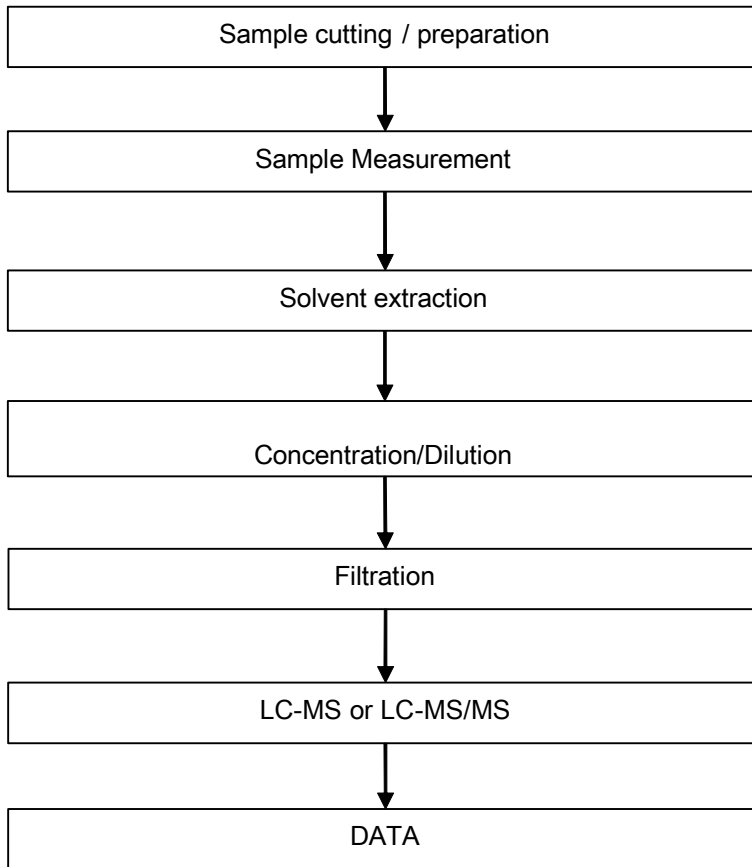


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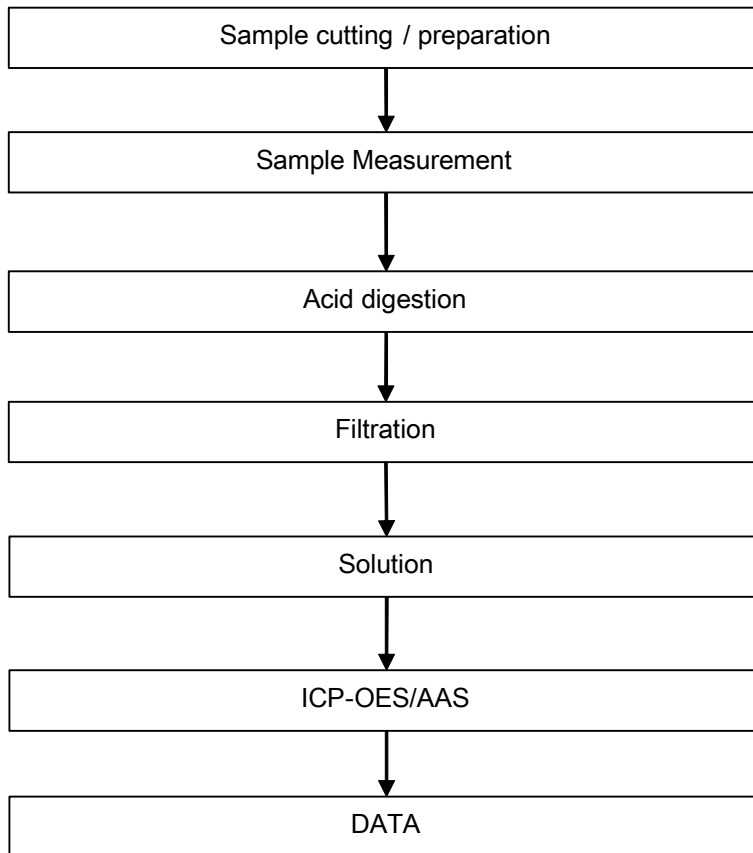
### PFOA / PFOS Testing Flow Chart





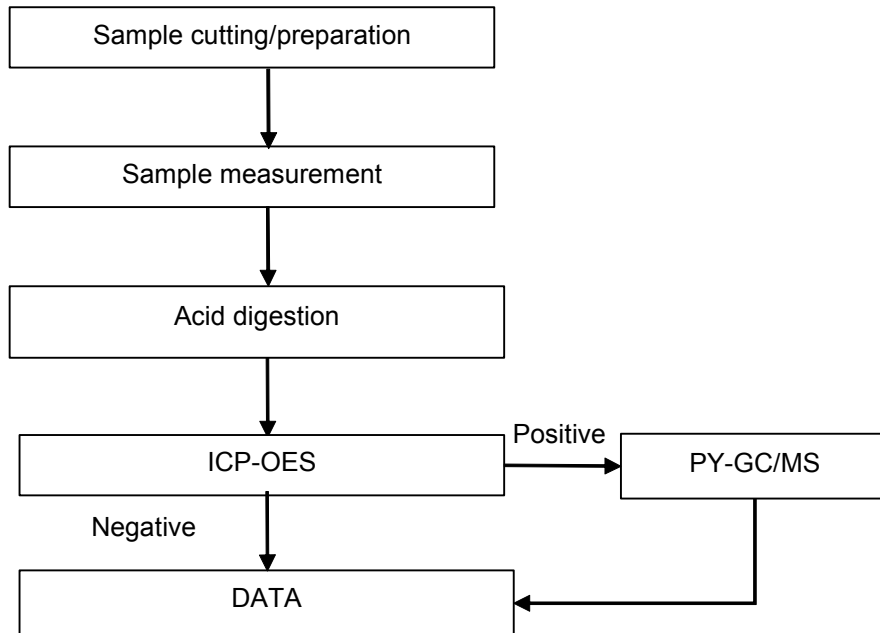
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Elementary Testing Flow Chart



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### Red phosphorus Testing Flow Chart

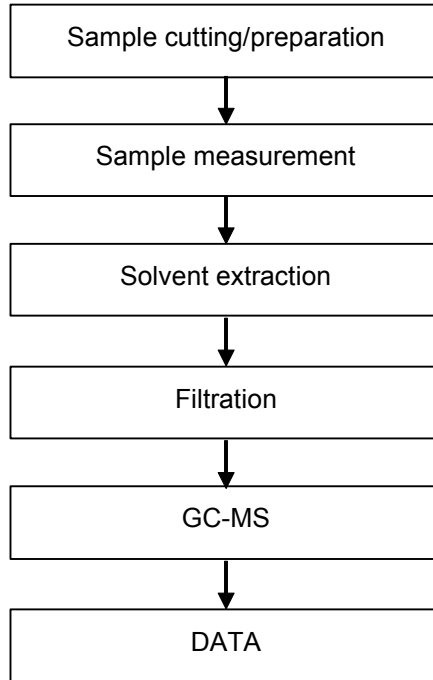


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**Persistent, Bioaccumulative, and Toxic (PBT) Chemicals Testing Flow Chart**

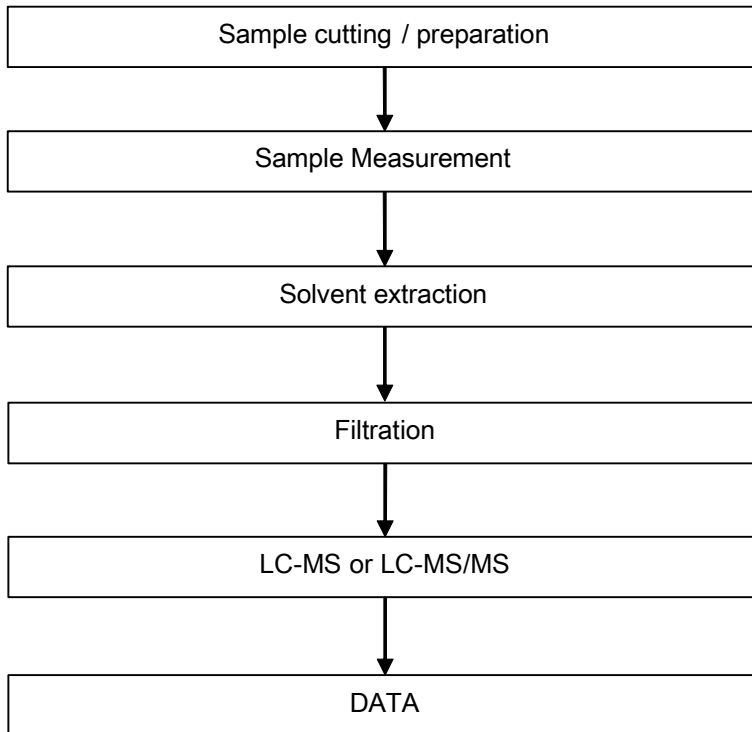


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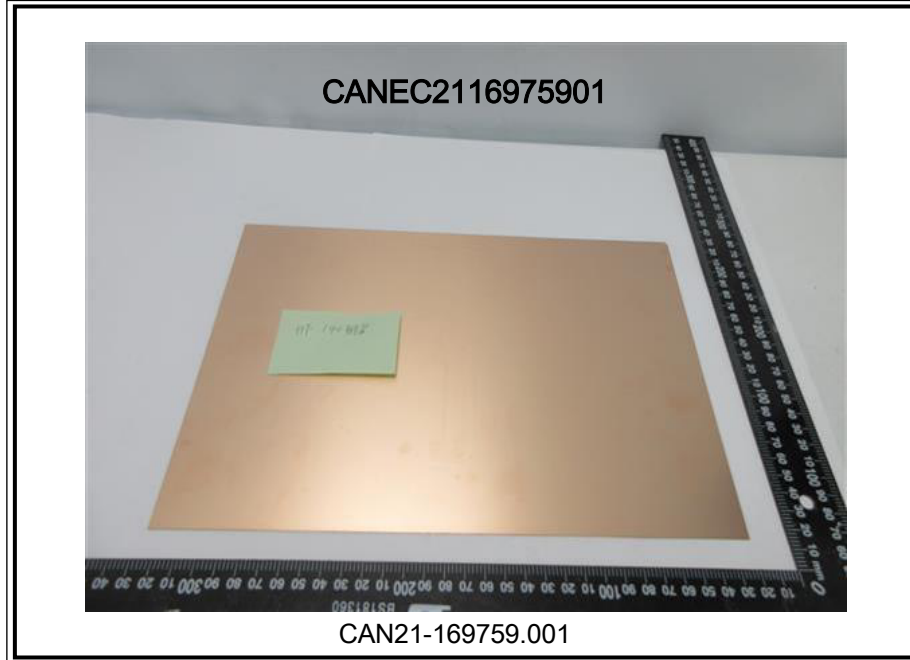
### TBBP-A Testing Flow Chart



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