

Test Report

No.: SHAEC24009668101

Date: Aug 09, 2024

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Client Name: Shanghai JA Solar Technology Co., Ltd.

Client Address: No 118,Lane 3111,West Huangcheng Road,Fengxian District, 201401 Shanghai,P.R.China.

Sample Name: Mono crystalline silicon photovoltaic (PV) modules

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

SGS Job No.: SHP24-014499

Sample Receiving Date: May 13, 2024

Testing Period: May 13, 2024 ~ May 21, 2024

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 (PBB), Polybrominated diphenyl ethers (PBDE), Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP)	Pass

Signed for and on behalf of
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

Dora Hu

Dora Hu

Approved Signatory

scan to see the report



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Test Result(s):

Test Part Description:

SN ID	Sample No.	SGS Sample ID	Description
SN1	A1	SHA24-0096681-0001.C001	White solid sheet
SN2	A2	SHA24-0096681-0001.C002	Black/white solid sheet
SN3	A3	SHA24-0096681-0001.C003	White solid sheet
SN4	A4	SHA24-0096681-0001.C004	White translucent soft solid
SN5	A5	SHA24-0096681-0001.C005	White soft solid
SN6	A6	SHA24-0096681-0001.C006	White translucent soft solid
SN7	A7	SHA24-0096681-0001.C007	White translucent soft solid
SN8	A8	SHA24-0096681-0001.C008	White translucent soft solid
SN9	A9	SHA24-0096681-0001.C009	Black soft solid
SN10	A10	SHA24-0096681-0001.C010	Colorless transparent solid
SN11	A11	SHA24-0096681-0001.C011	Colorless transparent/black glass
SN12	A12	SHA24-0096681-0001.C012	Blue/white solid sheet
SN13	A13	SHA24-0096681-0001.C013	Black/white solid sheet

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 (PBB), Polybrominated diphenyl ethers (PBDE), 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/AAS, UV-Vis and GC-MS.

Test Item(s)	Limit	Unit(s)	MDL	A1	A2	A3
Lead (Pb)	1000	mg/kg	2	ND	ND	ND
Mercury (Hg)	1000	mg/kg	2	ND	ND	ND
Cadmium (Cd)	100	mg/kg	2	ND	ND	ND
Hexavalent Chromium (Cr(VI))	1000	mg/kg	8	ND	ND	ND
Polybromobiphenyl (PBB)	1000	mg/kg	-	ND	ND	ND
Monobrominated biphenyl (MonoBB)	-	mg/kg	5	ND	ND	ND
Dibrominated biphenyl (DiBB)	-	mg/kg	5	ND	ND	ND
Tribrominated biphenyl (TriBB)	-	mg/kg	5	ND	ND	ND
Tetrabrominated biphenyl (TetraBB)	-	mg/kg	5	ND	ND	ND
Pentabrominated biphenyl (PentaBB)	-	mg/kg	5	ND	ND	ND
Hexabrominated biphenyl (HexaBB)	-	mg/kg	5	ND	ND	ND
Heptabrominated biphenyl (HeptaBB)	-	mg/kg	5	ND	ND	ND



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Test Item(s)	Limit	Unit(s)	MDL	A1	A2	A3
Octabrominated biphenyl (OctaBB)	-	mg/kg	5	ND	ND	ND
Nonabrominated biphenyl (NonaBB)	-	mg/kg	5	ND	ND	ND
Decabrominated biphenyl (DecaBB)	-	mg/kg	5	ND	ND	ND
Polybromodiphenyl ether(PBDE)	1000	mg/kg	-	ND	ND	ND
Monobrominated diphenyl ether (MonoBDE)	-	mg/kg	5	ND	ND	ND
Dibrominated diphenyl ether (DiBDE)	-	mg/kg	5	ND	ND	ND
Tribrominated diphenyl ether (TriBDE)	-	mg/kg	5	ND	ND	ND
Tetrabrominated diphenyl ether (TetraBDE)	-	mg/kg	5	ND	ND	ND
Pentabrominated diphenyl ether (PentaBDE)	-	mg/kg	5	ND	ND	ND
Hexabrominated diphenyl ether (HexaBDE)	-	mg/kg	5	ND	ND	ND
Heptabrominated diphenyl ether (HeptaBDE)	-	mg/kg	5	ND	ND	ND
Octabrominated diphenyl ether (OctaBDE)	-	mg/kg	5	ND	ND	ND
Nonabrominated diphenyl ether (NonaBDE)	-	mg/kg	5	ND	ND	ND
Decabrominated diphenyl ether (DecaBDE)	-	mg/kg	5	ND	ND	ND
Bis(2-ethylhexyl) phthalate (DEHP)	1000	mg/kg	50	ND	ND	ND
Butyl benzyl phthalate (BBP)	1000	mg/kg	50	ND	ND	ND
Dibutyl phthalate (DBP)	1000	mg/kg	50	ND	ND	ND
Diisobutyl phthalate (DIBP)	1000	mg/kg	50	ND	ND	ND

Test Item(s)	Limit	Unit(s)	MDL	A4	A5	A6
Lead (Pb)	1000	mg/kg	2	ND	ND	ND
Mercury (Hg)	1000	mg/kg	2	ND	ND	ND
Cadmium (Cd)	100	mg/kg	2	ND	ND	ND
Hexavalent Chromium (Cr(VI))	1000	mg/kg	8	ND	ND	ND
Polybromobiphenyl (PBB)	1000	mg/kg	-	ND	ND	ND
Monobrominated biphenyl (MonoBB)	-	mg/kg	5	ND	ND	ND
Dibrominated biphenyl (DiBB)	-	mg/kg	5	ND	ND	ND
Tribrominated biphenyl (TriBB)	-	mg/kg	5	ND	ND	ND
Tetrabrominated biphenyl (TetraBB)	-	mg/kg	5	ND	ND	ND
Pentabrominated biphenyl (PentaBB)	-	mg/kg	5	ND	ND	ND
Hexabrominated biphenyl (HexaBB)	-	mg/kg	5	ND	ND	ND



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Test Item(s)	Limit	Unit(s)	MDL	A4	A5	A6
Heptabrominated biphenyl (HeptaBB)	-	mg/kg	5	ND	ND	ND
Octabrominated biphenyl (OctaBB)	-	mg/kg	5	ND	ND	ND
Nonabrominated biphenyl (NonaBB)	-	mg/kg	5	ND	ND	ND
Decabrominated biphenyl (DecaBB)	-	mg/kg	5	ND	ND	ND
Polybromodiphenyl ether (PBDE)	1000	mg/kg	-	ND	ND	ND
Monobrominated diphenyl ether (MonoBDE)	-	mg/kg	5	ND	ND	ND
Dibrominated diphenyl ether (DiBDE)	-	mg/kg	5	ND	ND	ND
Tribrominated diphenyl ether (TriBDE)	-	mg/kg	5	ND	ND	ND
Tetrabrominated diphenyl ether (TetraBDE)	-	mg/kg	5	ND	ND	ND
Pentabrominated diphenyl ether (PentaBDE)	-	mg/kg	5	ND	ND	ND
Hexabrominated diphenyl ether (HexaBDE)	-	mg/kg	5	ND	ND	ND
Heptabrominated diphenyl ether (HeptaBDE)	-	mg/kg	5	ND	ND	ND
Octabrominated diphenyl ether (OctaBDE)	-	mg/kg	5	ND	ND	ND
Nonabrominated diphenyl ether (NonaBDE)	-	mg/kg	5	ND	ND	ND
Decabrominated diphenyl ether (DecaBDE)	-	mg/kg	5	ND	ND	ND
Bis(2-ethylhexyl) phthalate (DEHP)	1000	mg/kg	50	ND	ND	ND
Butyl benzyl phthalate (BBP)	1000	mg/kg	50	ND	ND	ND
Dibutyl phthalate (DBP)	1000	mg/kg	50	ND	ND	ND
Diisobutyl phthalate (DIBP)	1000	mg/kg	50	ND	ND	ND

Test Item(s)	Limit	Unit(s)	MDL	A7	A8	A9
Lead (Pb)	1000	mg/kg	2	ND	ND	ND
Mercury (Hg)	1000	mg/kg	2	ND	ND	ND
Cadmium (Cd)	100	mg/kg	2	ND	ND	ND
Hexavalent Chromium (Cr(VI))	1000	mg/kg	8	ND	ND	ND
Polybromobiphenyl (PBB)	1000	mg/kg	-	ND	ND	ND
Monobrominated biphenyl (MonoBB)	-	mg/kg	5	ND	ND	ND
Dibrominated biphenyl (DiBB)	-	mg/kg	5	ND	ND	ND
Tribrominated biphenyl (TriBB)	-	mg/kg	5	ND	ND	ND
Tetrabrominated biphenyl (TetraBB)	-	mg/kg	5	ND	ND	ND
Pentabrominated biphenyl (PentaBB)	-	mg/kg	5	ND	ND	ND



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Test Item(s)	Limit	Unit(s)	MDL	A7	A8	A9
Hexabrominated biphenyl (HexaBB)	-	mg/kg	5	ND	ND	ND
Heptabrominated biphenyl (HeptaBB)	-	mg/kg	5	ND	ND	ND
Octabrominated biphenyl (OctaBB)	-	mg/kg	5	ND	ND	ND
Nonabrominated biphenyl (NonaBB)	-	mg/kg	5	ND	ND	ND
Decabrominated biphenyl (DecaBB)	-	mg/kg	5	ND	ND	ND
Polybromodiphenyl ether (PBDE)	1000	mg/kg	-	ND	ND	ND
Monobrominated diphenyl ether (MonoBDE)	-	mg/kg	5	ND	ND	ND
Dibrominated diphenyl ether (DiBDE)	-	mg/kg	5	ND	ND	ND
Tribrominated diphenyl ether (TriBDE)	-	mg/kg	5	ND	ND	ND
Tetrabrominated diphenyl ether (TetraBDE)	-	mg/kg	5	ND	ND	ND
Pentabrominated diphenyl ether (PentaBDE)	-	mg/kg	5	ND	ND	ND
Hexabrominated diphenyl ether (HexaBDE)	-	mg/kg	5	ND	ND	ND
Heptabrominated diphenyl ether (HeptaBDE)	-	mg/kg	5	ND	ND	ND
Octabrominated diphenyl ether (OctaBDE)	-	mg/kg	5	ND	ND	ND
Nonabrominated diphenyl ether (NonaBDE)	-	mg/kg	5	ND	ND	ND
Decabrominated diphenyl ether (DecaBDE)	-	mg/kg	5	ND	ND	ND
Bis(2-ethylhexyl) phthalate (DEHP)	1000	mg/kg	50	ND	ND	ND
Butyl benzyl phthalate (BBP)	1000	mg/kg	50	ND	ND	ND
Dibutyl phthalate (DBP)	1000	mg/kg	50	ND	ND	ND
Diisobutyl phthalate (DIBP)	1000	mg/kg	50	ND	ND	ND

Test Item(s)	Limit	Unit(s)	MDL	A10	A11	A12
Lead (Pb)	1000	mg/kg	2	ND	ND	ND
Mercury (Hg)	1000	mg/kg	2	ND	ND	ND
Cadmium (Cd)	100	mg/kg	2	ND	ND	ND
Hexavalent Chromium (Cr(VI))	1000	mg/kg	8	ND	ND	ND
Polybromobiphenyl (PBB)	1000	mg/kg	-	ND	ND	ND
Monobrominated biphenyl (MonoBB)	-	mg/kg	5	ND	ND	ND
Dibrominated biphenyl (DiBB)	-	mg/kg	5	ND	ND	ND
Tribrominated biphenyl (TriBB)	-	mg/kg	5	ND	ND	ND
Tetrabrominated biphenyl (TetraBB)	-	mg/kg	5	ND	ND	ND



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Test Item(s)	Limit	Unit(s)	MDL	A10	A11	A12
Pentabrominated biphenyl (PentaBB)	-	mg/kg	5	ND	ND	ND
Hexabrominated biphenyl (HexaBB)	-	mg/kg	5	ND	ND	ND
Heptabrominated biphenyl (HeptaBB)	-	mg/kg	5	ND	ND	ND
Octabrominated biphenyl (OctaBB)	-	mg/kg	5	ND	ND	ND
Nonabrominated biphenyl (NonaBB)	-	mg/kg	5	ND	ND	ND
Decabrominated biphenyl (DecaBB)	-	mg/kg	5	ND	ND	ND
Polybromodiphenyl ether (PBDE)	1000	mg/kg	-	ND	ND	ND
Monobrominated diphenyl ether (MonoBDE)	-	mg/kg	5	ND	ND	ND
Dibrominated diphenyl ether (DiBDE)	-	mg/kg	5	ND	ND	ND
Tribrominated diphenyl ether (TriBDE)	-	mg/kg	5	ND	ND	ND
Tetrabrominated diphenyl ether (TetraBDE)	-	mg/kg	5	ND	ND	ND
Pentabrominated diphenyl ether (PentaBDE)	-	mg/kg	5	ND	ND	ND
Hexabrominated diphenyl ether (HexaBDE)	-	mg/kg	5	ND	ND	ND
Heptabrominated diphenyl ether (HeptaBDE)	-	mg/kg	5	ND	ND	ND
Octabrominated diphenyl ether (OctaBDE)	-	mg/kg	5	ND	ND	ND
Nonabrominated diphenyl ether (NonaBDE)	-	mg/kg	5	ND	ND	ND
Decabrominated diphenyl ether (DecaBDE)	-	mg/kg	5	ND	ND	ND
Bis(2-ethylhexyl) phthalate (DEHP)	1000	mg/kg	50	ND	ND	ND
Butyl benzyl phthalate (BBP)	1000	mg/kg	50	ND	ND	ND
Dibutyl phthalate (DBP)	1000	mg/kg	50	ND	ND	ND
Diisobutyl phthalate (DIBP)	1000	mg/kg	50	ND	ND	ND

Test Item(s)	Limit	Unit(s)	MDL	A13
Lead (Pb)	1000	mg/kg	2	ND
Mercury (Hg)	1000	mg/kg	2	ND
Cadmium (Cd)	100	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))	1000	mg/kg	8	ND
Polybromobiphenyl (PBB)	1000	mg/kg	-	ND
Monobrominated biphenyl (MonoBB)	-	mg/kg	5	ND
Dibrominated biphenyl (DiBB)	-	mg/kg	5	ND
Tribrominated biphenyl (TriBB)	-	mg/kg	5	ND



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Tetrabrominated biphenyl (TetraBB)	-	mg/kg	5	ND
Pentabrominated biphenyl (PentaBB)	-	mg/kg	5	ND
Hexabrominated biphenyl (HexaBB)	-	mg/kg	5	ND
Heptabrominated biphenyl (HeptaBB)	-	mg/kg	5	ND
Octabrominated biphenyl (OctaBB)	-	mg/kg	5	ND
Nonabrominated biphenyl (NonaBB)	-	mg/kg	5	ND
Decabrominated biphenyl (DecaBB)	-	mg/kg	5	ND
Polybromodiphenyl ether(PBDE)	1000	mg/kg	-	ND
Monobrominated diphenyl ether (MonoBDE)	-	mg/kg	5	ND
Dibrominated diphenyl ether (DiBDE)	-	mg/kg	5	ND
Tribrominated diphenyl ether (TriBDE)	-	mg/kg	5	ND
Tetrabrominated diphenyl ether (TetraBDE)	-	mg/kg	5	ND
Pentabrominated diphenyl ether (PentaBDE)	-	mg/kg	5	ND
Hexabrominated diphenyl ether (HexaBDE)	-	mg/kg	5	ND
Heptabrominated diphenyl ether (HeptaBDE)	-	mg/kg	5	ND
Octabrominated diphenyl ether (OctaBDE)	-	mg/kg	5	ND
Nonabrominated diphenyl ether (NonaBDE)	-	mg/kg	5	ND
Decabrominated diphenyl ether (DecaBDE)	-	mg/kg	5	ND
Bis(2-ethylhexyl) phthalate (DEHP)	1000	mg/kg	50	ND
Butyl benzyl phthalate (BBP)	1000	mg/kg	50	ND
Dibutyl phthalate (DBP)	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.

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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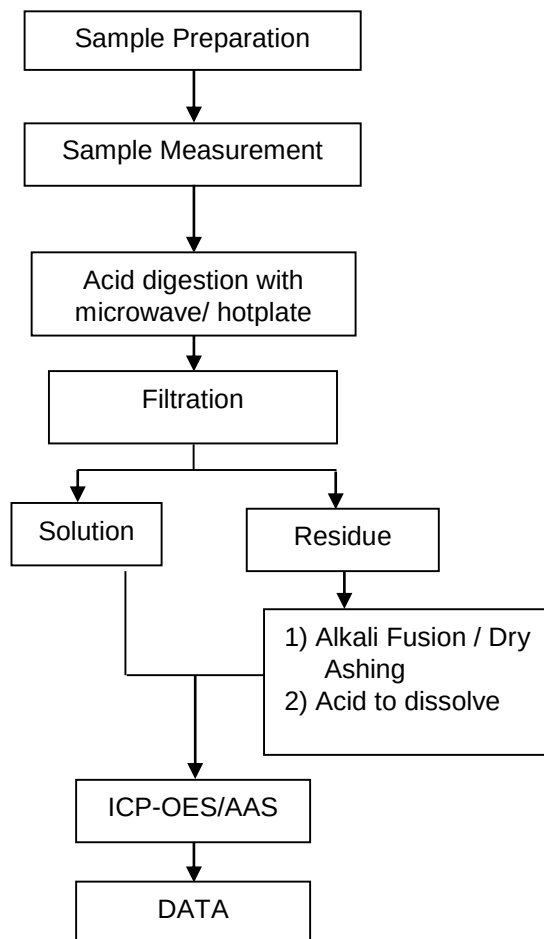
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Elements Testing Flow Chart

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



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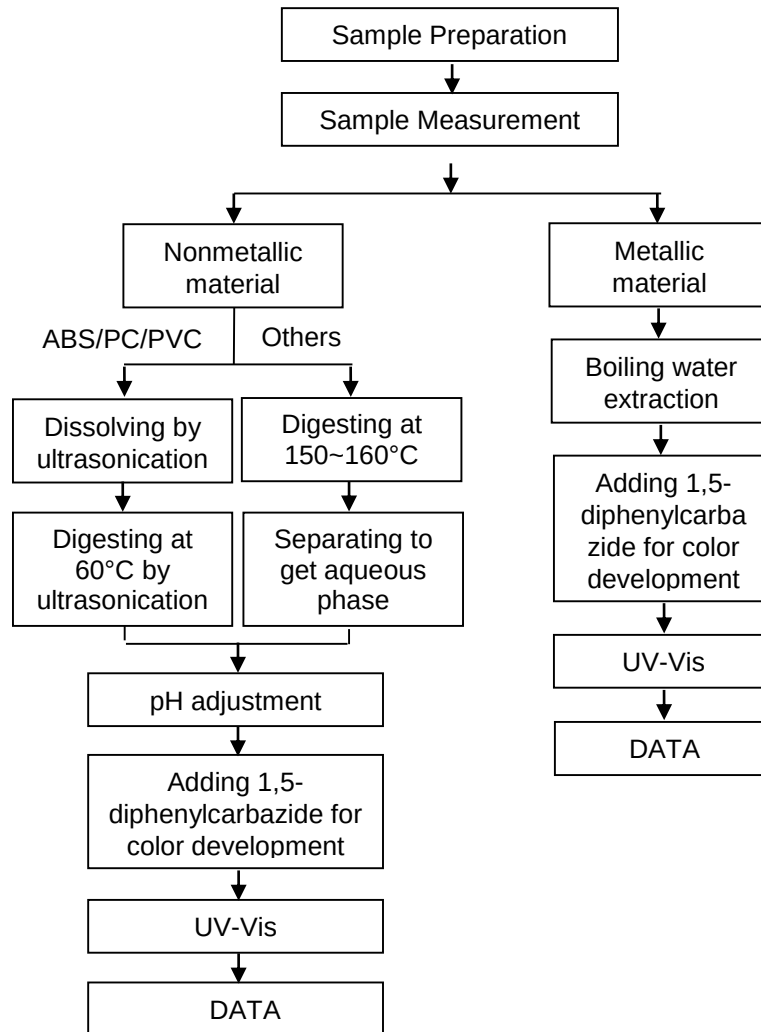
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Hexavalent Chromium (Cr(VI)) Testing Flow Chart



Test Report

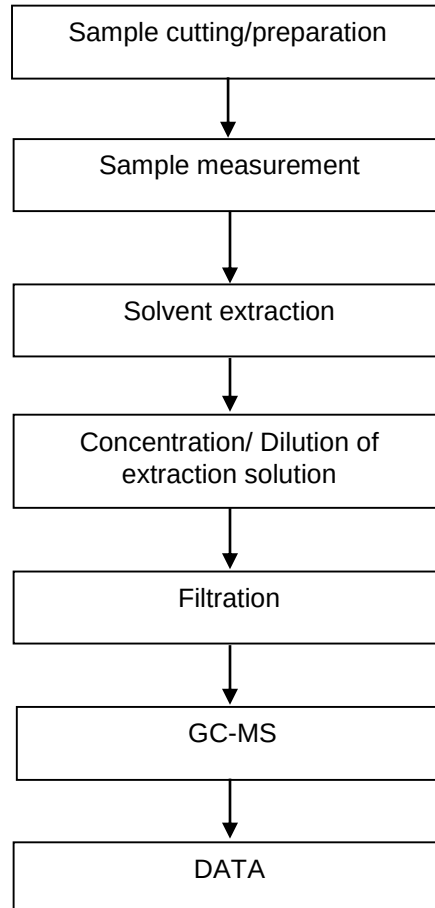
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PBB/PBDE Testing Flow Chart



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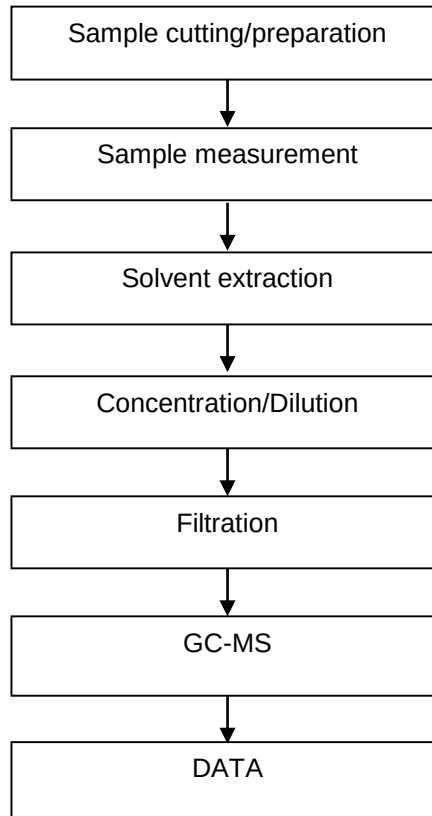
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Phthalates Testing Flow Chart



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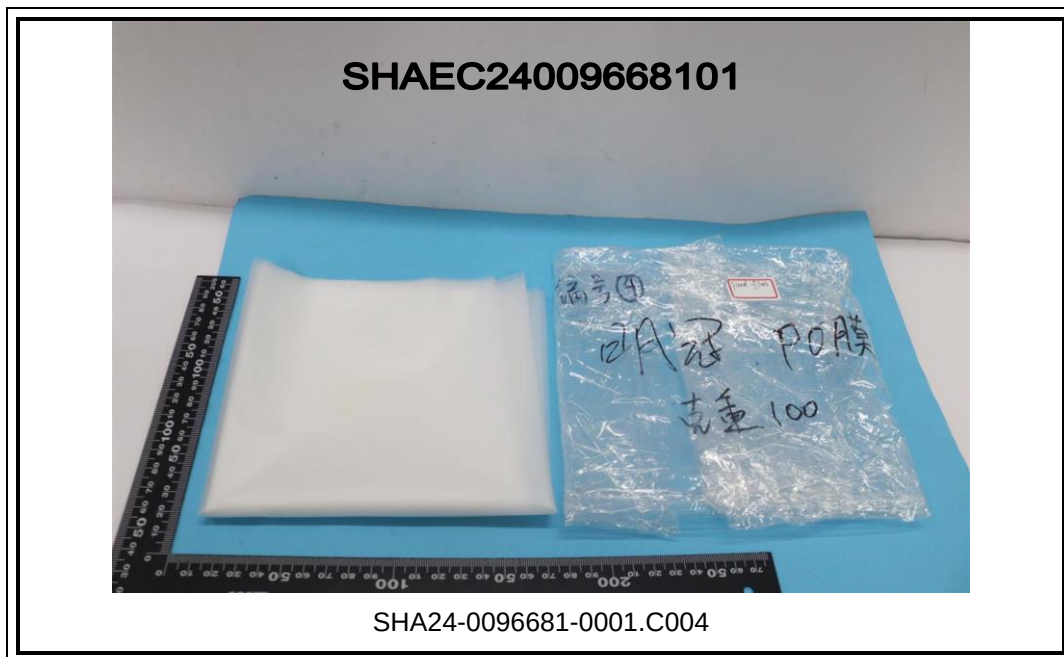
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