

# Test Report

No.: SHAEC23000366222

Date: Feb 06, 2023

Page 1 of 16

Client Name: YANGZHOU YANGJIE ELECTRONIC TECHNOLOGY CO., LTD.

Client Address: NO.26 MID PIONEER PARK ROAD, HANJIANG, YANGZHOU

Sample Name: Bridge

Client Ref. Information: GPP Chip; SKY Chip; Lead Frame/Jumper/Lead Wire; Solder Paste/Solder Perform/Solder Wire; Molding Compound (halogen Free 1) ; Molding Compound (halogen Free 3) ; Molding Compound (halogen 1) ; Aluminum Slice; Tin Ball

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

SGS Job No.: SP23-000791

Sample Receiving Date: Jan 10, 2023

Testing Period: Jan 10, 2023 - Feb 02, 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

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

Tom Ni

Tom Ni  
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	A2	SHA23-0003662-0001.C002	Silvery metal
SN2	A3	SHA23-0003662-0001.C003	Gray solid
SN3	A4	SHA23-0003662-0001.C004	Black solid
SN4	A5	SHA23-0003662-0001.C005	Silvery/black solid
SN5	A9	SHA23-0003662-0001.C009	Black solid
SN6	A11	SHA23-0003662-0001.C011	Copper metal
SN7	A12	SHA23-0003662-0001.C012	Silvery metal
SN8	A27	SHA23-0003662-0001.C027	Silvery metal wire
SN9	A39	SHA23-0003662-0001.C039	Silvery/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)**

Test Method: With reference to IEC 62321-4:2013+AMD1:2017, IEC 62321-5:2013, IEC 62321-7-1:2015, IEC 62321-6:2015 and IEC62321-8:2017, analysis was performed by ICP-OES, AAS, UV-Vis and GC-MS.

Test Item(s)	Limit	Unit(s)	MDL	A2	A11	A12
Cadmium(Cd)	100	mg/kg	2	ND	ND	ND
Lead(Pb)	1000	mg/kg	2	41	11	8
Mercury(Hg)	1000	mg/kg	2	ND	ND	ND
Hexavalent Chromium (Cr(VI))▼	-	µg/cm <sup>2</sup>	0.10	ND	ND	ND
Polybromobiphenyl (PBBs)	1000	mg/kg	-	ND	ND	ND
Monobromobiphenyl (MonoBB)	-	mg/kg	5	ND	ND	ND
Dibromobiphenyl (DiBB)	-	mg/kg	5	ND	ND	ND
Tribromobiphenyl (TriBB)	-	mg/kg	5	ND	ND	ND
Tetrabromobiphenyl (TetraBB)	-	mg/kg	5	ND	ND	ND
Pentabromobiphenyl (PentaBB)	-	mg/kg	5	ND	ND	ND
Hexabromobiphenyl (HexaBB)	-	mg/kg	5	ND	ND	ND
Heptabromobiphenyl (HeptaBB)	-	mg/kg	5	ND	ND	ND
Octabromobiphenyl (OctaBB)	-	mg/kg	5	ND	ND	ND
Nonabromobiphenyl (NonaBB)	-	mg/kg	5	ND	ND	ND
Decabromobiphenyl (DecaBB)	-	mg/kg	5	ND	ND	ND
Polybromodiphenyl ether(PBDEs)	1000	mg/kg	-	ND	ND	ND
Monobromodiphenylether (MonoBDE)	-	mg/kg	5	ND	ND	ND
Dibromodiphenylether (DiBDE)	-	mg/kg	5	ND	ND	ND
Tribromodiphenylether (TriBDE)	-	mg/kg	5	ND	ND	ND



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Test Item(s)	Limit	Unit(s)	MDL	A2	A11	A12
Tetrabromodiphenylether (TetraBDE)	-	mg/kg	5	ND	ND	ND
Pentabromodiphenylether (PentaBDE)	-	mg/kg	5	ND	ND	ND
Hexabromodiphenylether (HexaBDE)	-	mg/kg	5	ND	ND	ND
Heptabromodiphenylether (HeptaBDE)	-	mg/kg	5	ND	ND	ND
Octabromodiphenylether (OctaBDE)	-	mg/kg	5	ND	ND	ND
Nonabromodiphenylether (NonaBDE)	-	mg/kg	5	ND	ND	ND
Decabromodiphenylether (DecaBDE)	-	mg/kg	5	ND	ND	ND
Dibutyl Phthalate(DBP)	1000	mg/kg	50	ND	ND	ND
Benzyl Butyl Phthalate(BBP)	1000	mg/kg	50	ND	ND	ND
Bis-(2-ethylhexyl) Phthalate(DEHP)	1000	mg/kg	50	ND	ND	ND
Diisobutyl Phthalate(DIBP)	1000	mg/kg	50	ND	ND	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) ▼ = a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 µg/cm<sup>2</sup>. The sample coating is considered to contain Cr(VI)
  - b. The sample is negative for Cr(VI) if Cr(VI) is ND (concentration less than 0.10 µg/cm<sup>2</sup>). The coating is considered a non-Cr(VI) based coating
  - c. The result between 0.10 µg/cm<sup>2</sup> and 0.13 µg/cm<sup>2</sup> is considered to be inconclusive - unavoidable coating variations may influence the determination

Information on storage conditions and production date of the tested sample is unavailable and thus Cr(VI) results represent status of the sample at the time of testing.

**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 IEC62321-8:2017, analysis was performed by ICP-OES, UV-Vis and GC-MS.

Test Item(s)	Limit	Unit(s)	MDL	A3	A4	A5
Cadmium(Cd)	100	mg/kg	2	ND	ND	ND
Lead (Pb)	1000	mg/kg	2	ND	ND	43560▲
Mercury (Hg)	1000	mg/kg	2	ND	ND	ND
Hexavalent Chromium (Cr(VI))	1000	mg/kg	8	ND	ND	ND
Polybromobiphenyl (PBBs)	1000	mg/kg	-	ND	ND	ND
Monobromobiphenyl (MonoBB)	-	mg/kg	5	ND	ND	ND



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Test Item(s)	Limit	Unit(s)	MDL	A3	A4	A5
Dibromobiphenyl (DiBB)	-	mg/kg	5	ND	ND	ND
Tribromobiphenyl (TriBB)	-	mg/kg	5	ND	ND	ND
Tetrabromobiphenyl (TetraBB)	-	mg/kg	5	ND	ND	ND
Pentabromobiphenyl (PentaBB)	-	mg/kg	5	ND	ND	ND
Hexabromobiphenyl (HexaBB)	-	mg/kg	5	ND	ND	ND
Heptabromobiphenyl (HeptaBB)	-	mg/kg	5	ND	ND	ND
Octabromobiphenyl (OctaBB)	-	mg/kg	5	ND	ND	ND
Nonabromobiphenyl (NonaBB)	-	mg/kg	5	ND	ND	ND
Decabromobiphenyl (DecaBB)	-	mg/kg	5	ND	ND	ND
Polybromodiphenyl ether(PBDEs)	1000	mg/kg	-	ND	ND	ND
Monobromodiphenylether (MonoBDE)	-	mg/kg	5	ND	ND	ND
Dibromodiphenylether (DiBDE)	-	mg/kg	5	ND	ND	ND
Tribromodiphenylether (TriBDE)	-	mg/kg	5	ND	ND	ND
Tetrabromodiphenylether (TetraBDE)	-	mg/kg	5	ND	ND	ND
Pentabromodiphenylether (PentaBDE)	-	mg/kg	5	ND	ND	ND
Hexabromodiphenylether (HexaBDE)	-	mg/kg	5	ND	ND	ND
Heptabromodiphenylether (HeptaBDE)	-	mg/kg	5	ND	ND	ND
Octabromodiphenylether (OctaBDE)	-	mg/kg	5	ND	ND	ND
Nonabromodiphenylether (NonaBDE)	-	mg/kg	5	ND	ND	ND
Decabromodiphenylether (DecaBDE)	-	mg/kg	5	ND	ND	ND
Dibutyl Phthalate(DBP)	1000	mg/kg	50	ND	ND	ND
Benzyl Butyl Phthalate(BBP)	1000	mg/kg	50	ND	ND	ND
Bis-(2-ethylhexyl) Phthalate(DEHP)	1000	mg/kg	50	ND	ND	ND
Diisobutyl Phthalate(DIBP)	1000	mg/kg	50	ND	ND	ND

Test Item(s)	Limit	Unit(s)	MDL	A9	A39
Cadmium (Cd)	100	mg/kg	2	ND	ND
Lead (Pb)	1000	mg/kg	2	ND	ND
Mercury (Hg)	1000	mg/kg	2	ND	ND
Hexavalent Chromium (Cr(VI))	1000	mg/kg	8	ND	ND
Polybromobiphenyl (PBBs)	1000	mg/kg	-	ND	ND
Monobromobiphenyl (MonoBB)	-	mg/kg	5	ND	ND
Dibromobiphenyl (DiBB)	-	mg/kg	5	ND	ND
Tribromobiphenyl (TriBB)	-	mg/kg	5	ND	ND
Tetrabromobiphenyl (TetraBB)	-	mg/kg	5	ND	ND
Pentabromobiphenyl (PentaBB)	-	mg/kg	5	ND	ND
Hexabromobiphenyl (HexaBB)	-	mg/kg	5	ND	ND
Heptabromobiphenyl (HeptaBB)	-	mg/kg	5	ND	ND
Octabromobiphenyl (OctaBB)	-	mg/kg	5	ND	ND
Nonabromobiphenyl (NonaBB)	-	mg/kg	5	ND	ND



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Test Item(s)	Limit	Unit(s)	MDL	A9	A39
Decabromobiphenyl (DecaBB)	-	mg/kg	5	ND	ND
Polybromodiphenyl ether(PBDEs)	1000	mg/kg	-	ND	ND
Monobromodiphenylether (MonoBDE)	-	mg/kg	5	ND	ND
Dibromodiphenylether (DiBDE)	-	mg/kg	5	ND	ND
Tribromodiphenylether (TriBDE)	-	mg/kg	5	ND	ND
Tetrabromodiphenylether (TetraBDE)	-	mg/kg	5	ND	ND
Pentabromodiphenylether (PentaBDE)	-	mg/kg	5	ND	ND
Hexabromodiphenylether (HexaBDE)	-	mg/kg	5	ND	ND
Heptabromodiphenylether (HeptaBDE)	-	mg/kg	5	ND	ND
Octabromodiphenylether (OctaBDE)	-	mg/kg	5	ND	ND
Nonabromodiphenylether (NonaBDE)	-	mg/kg	5	ND	ND
Decabromodiphenylether (DecaBDE)	-	mg/kg	5	ND	ND
Dibutyl Phthalate(DBP)	1000	mg/kg	50	ND	ND
Benzyl Butyl Phthalate(BBP)	1000	mg/kg	50	ND	ND
Bis-(2-ethylhexyl) Phthalate(DEHP)	1000	mg/kg	50	ND	ND
Diisobutyl Phthalate(DIBP)	1000	mg/kg	50	ND	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.
- (4) ▲ According to the declaration from the client, Lead (Pb) in No.A5 is exempted by EU RoHS directive 2011/65/EU based on [ANNEX III 7(c)-I]: Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectronic devices, or in a glass or ceramic matrix compound.

Test Method: With reference to Titration method, IEC 62321-4:2013+AMD1:2017, IEC 62321-5:2013, IEC 62321-7-1:2015, IEC 62321-6:2015 and IEC62321-8:2017, analysis was performed by ICP-OES, UV-Vis and GC-MS.

Test Item(s)	Limit	Unit(s)	MDL	A27
Cadmium(Cd)	100	mg/kg	2	ND
Lead(Pb)	0.1	%	-	92.4▲
Mercury(Hg)	1000	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))▼	-	µg/cm <sup>2</sup>	0.10	ND
Polybromobiphenyl (PBBs)	1000	mg/kg	-	ND
Monobromobiphenyl (MonoBB)	-	mg/kg	5	ND
Dibromobiphenyl (DiBB)	-	mg/kg	5	ND



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Test Item(s)	Limit	Unit(s)	MDL	A27
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) ▼ = a. The sample is positive for CrVI if the CrVI concentration is greater than 0.13 µg/cm<sup>2</sup>. The sample coating is considered to contain CrVI.  
 b. The sample is negative for CrVI if CrVI is ND (concentration less than 0.10 µg/cm<sup>2</sup>). The coating is considered a non-CrVI based coating.  
 c. The result between 0.10 µg/cm<sup>2</sup> and 0.13 µg/cm<sup>2</sup> is considered to be inconclusive - unavoidable coating variations may influence the determination.  
 Information on storage conditions and production date of the tested sample is unavailable and thus Cr(VI) results represent status of the sample at the time of testing.
- (4)▲ According to the declaration from the client, Lead (Pb) in No.A27 is exempted by EU RoHS directive 2011/65/EU based on |ANNEX III 7(a)|: Lead in high melting temperature type solders (i.e. lead-based alloys containing 85 % by weight or more lead).

The Latest Date of Sample A39 Received : 2023.02.02

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.



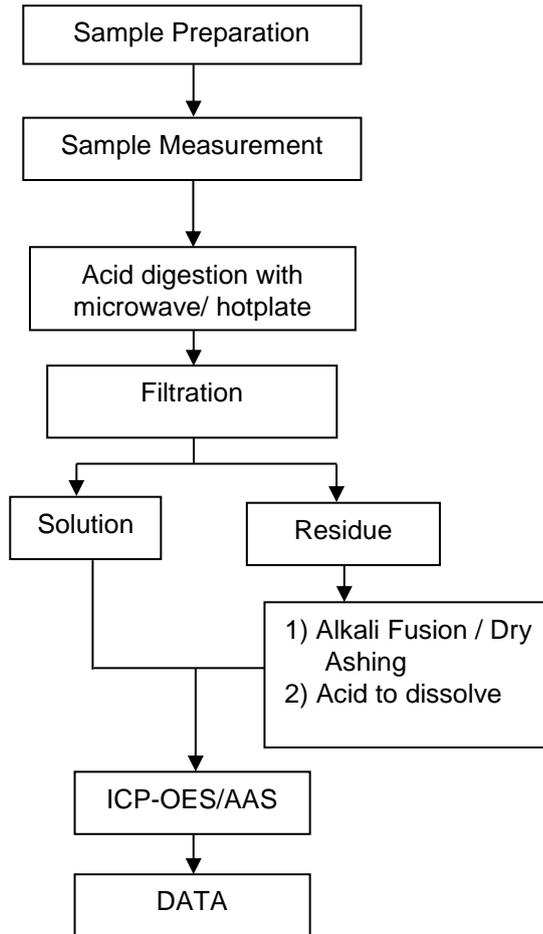
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**Elements (IEC62321) Testing Flow Chart**

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



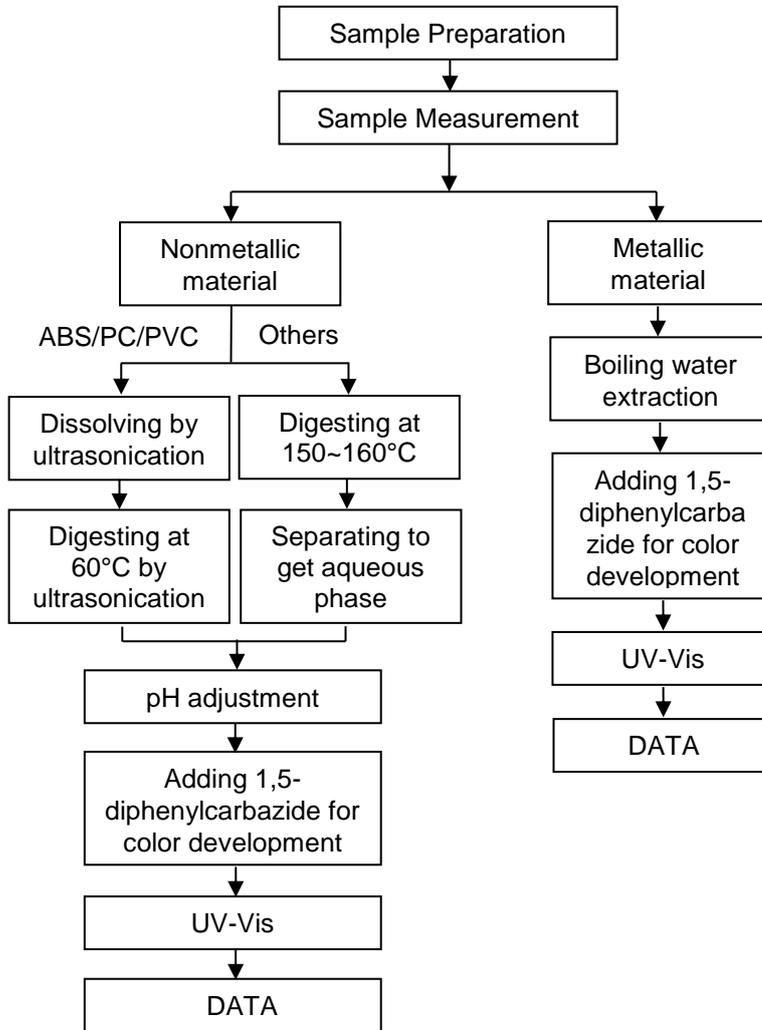
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**Hexavalent Chromium (Cr(VI)) Testing Flow Chart**

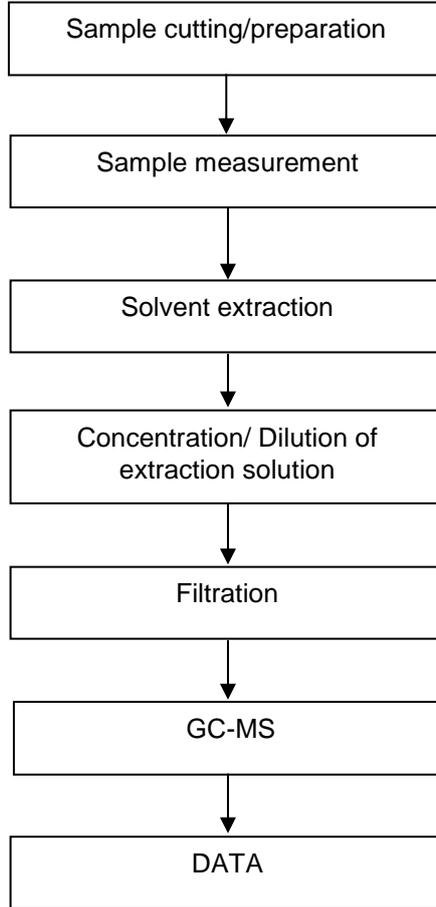


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**PBBs/PBDEs Testing Flow Chart**



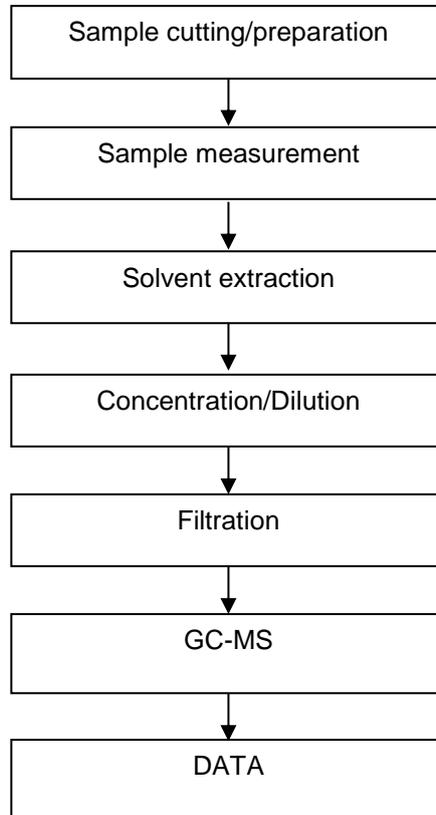
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**Phthalates Testing Flow Chart**



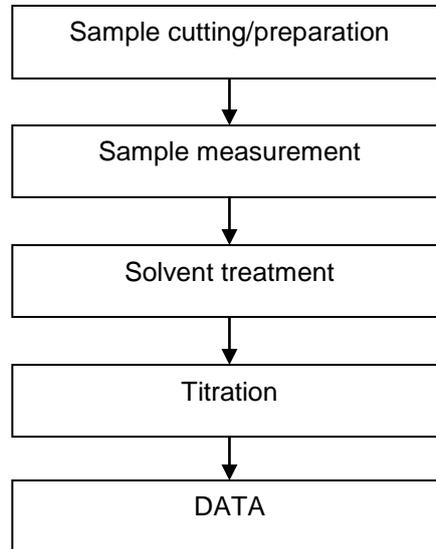
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### Titration Testing Flow Chart



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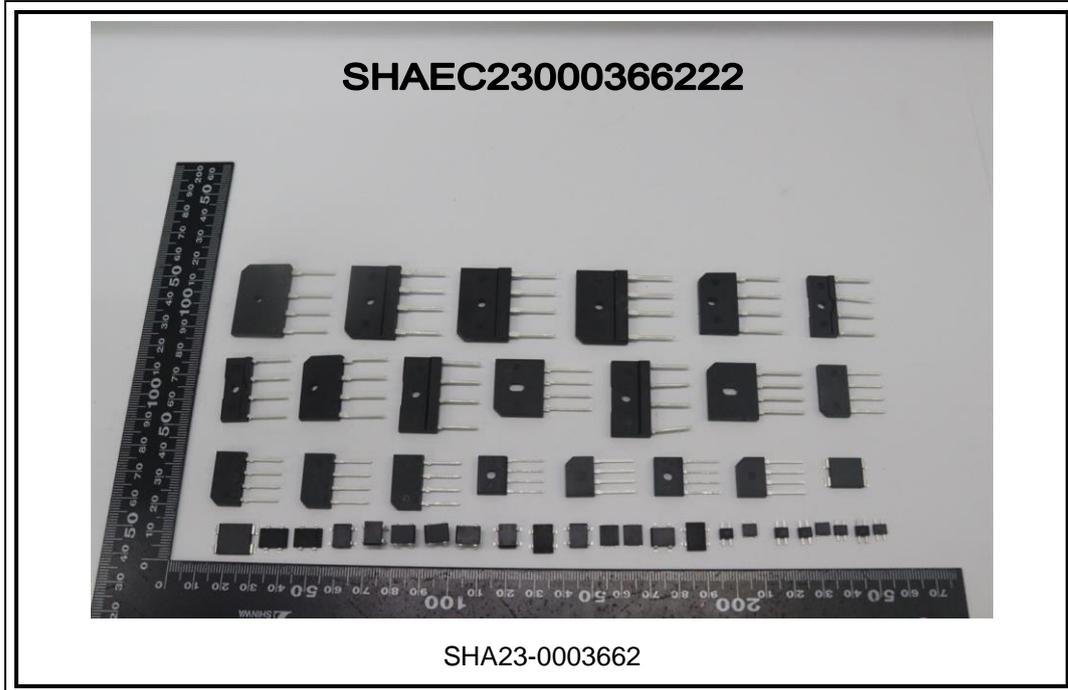
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Date: Feb 06, 2023

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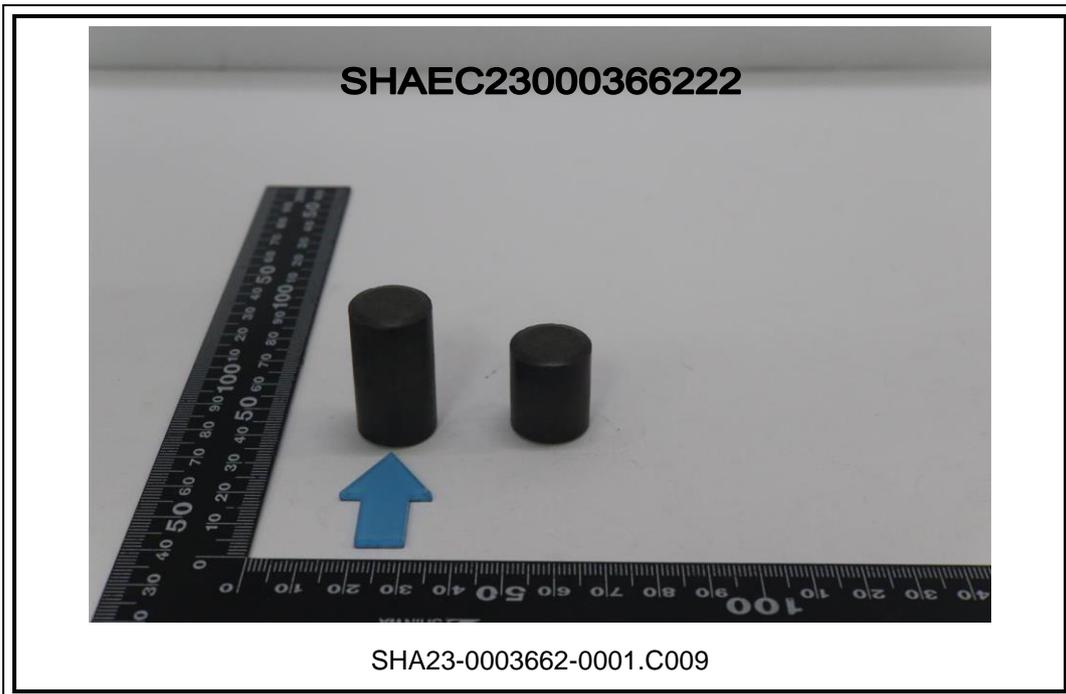
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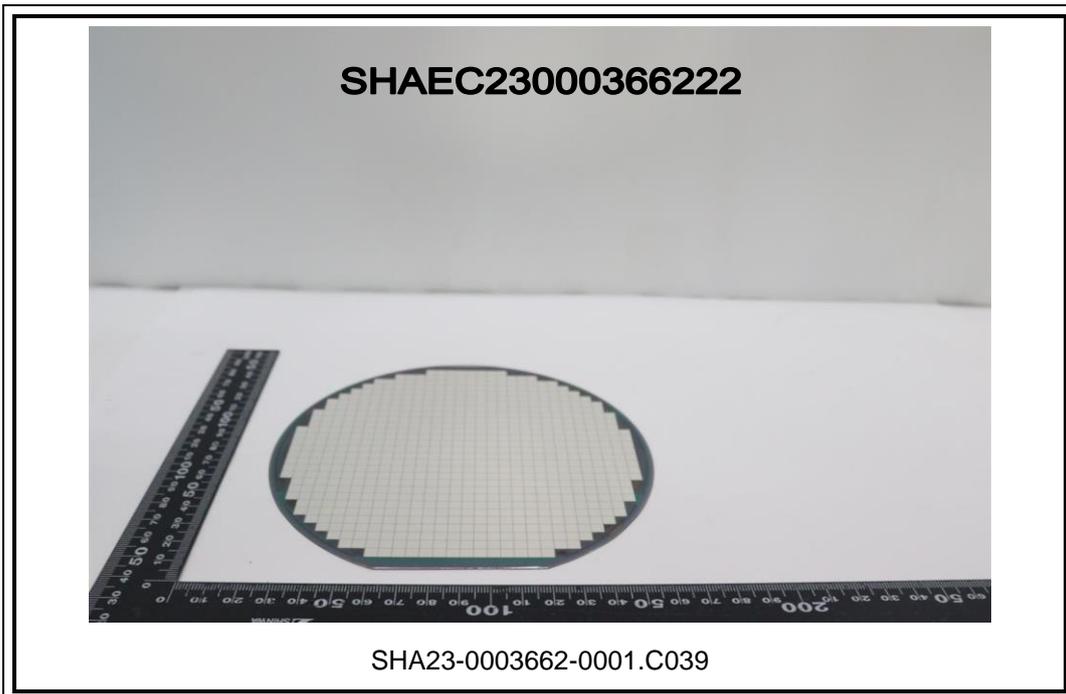
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