

Test Report No.: SHAEC24006435404 **Date:** Apr 12, 2024 Page 1 of 14

Client Name: SK HYNIX SYSTEM IC(WUXI) CO.,LTD

Client Address: 702 ZHIDE RD, XINWU DISTRICT, WUXI, JIANGSU CHINA

Sample Name: 200mm wafer

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

SGS Job No.: TIC1020240403115131Z8XJ

Sample Receiving Date: Apr 03, 2024

Testing Period: Apr 03, 2024 ~ Apr 12, 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
Chlorinated Phenols	See Results
Element(s)	See Results
Halogen	See Results
Polyvinyl chloride (PVC)	See Results
VOC	See Results
Bisphenol A	See Results

Signed for and on behalf of

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

Carol Luo

Approved Signatory





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Test Result(s):

Test Part Description:

SN ID	Sample No.	SGS Sample ID	Description
SN1	A2	SHA24-0064354-0001.C002	Colorful 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	A2
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
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



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Test Item(s)	Limit	Unit(s)	MDL	A2
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.

Chlorinated Phenols

With reference to FD CEN/TR 14823:2006, analysis was performed by GC-ECD or GC-MS. Test Method:

Test Item(s)	Unit(s)	MDL	A2
Pentachlorophenol(PCP)	mg/kg	0.1	ND
2,3,4,5-Tetrachlorophenol(2,3,4,5-TeCP)	mg/kg	0.05	ND
2,3,5,6-Tetrachlorophenol(2,3,5,6-TeCP)	mg/kg	0.05	ND
2,3,4,6-Tetrachlorophenol(2,3,4,6-TeCP)	mg/kg	0.05	ND
2,4,6-Trichlorophenol(2,4,6-TriCP)	mg/kg	0.05	ND
2,3,6-Trichlorophenol(2,3,6-TriCP)	mg/kg	0.05	ND
2,3,5-Trichlorophenol(2,3,5-TriCP)	mg/kg	0.05	ND
2,4,5-Trichlorophenol(2,4,5-TriCP)	mg/kg	0.05	ND
2,3,4-Trichlorophenol(2,3,4-TriCP)	mg/kg	0.05	ND
3,4,5-Trichlorophenol(3,4,5-TriCP)	mg/kg	0.05	ND
Tetrachlorophenol(TeCP)	mg/kg	_	ND

Element(s)

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

Test Item(s)	Unit(s)	MDL	A2
Arsenic(As)	mg/kg	10	ND
Silver(Ag)	mg/kg	10	ND
Beryllium(Be)	mg/kg	5	ND
Antimony(Sb)	mg/kg	10	ND

Halogen

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



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Test Item(s)	Unit(s)	MDL	A2
Fluorine(F)	mg/kg	20	ND
Chlorine(CI)	mg/kg	50	ND
Bromine(Br)	mg/kg	50	ND
Iodine(I)	mg/kg	50	ND

Polyvinyl chloride (PVC)

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

Test Item(s)	A2
Polyvinyl chloride (PVC)	Negative

Notes:

(1) Negative=Undetectable, Positive=Detectable

VOC

Test Method: with reference to US EPA 5021A:2014, analysis was performed by HS-GC-MS.

Test Item(s)	Unit(s)	MDL	A2
Benzene	mg/kg	1	ND
1,4-Dichlorobenzene	mg/kg	1	ND
Toluene	mg/kg	1	ND
Ethylbenzene	mg/kg	1	ND
m-Xylene/p-Xylene	mg/kg	2	ND
o-Xylene	mg/kg	1	ND
Styrene	mg/kg	1	ND
n-butylacetate	mg/kg	1	ND

Bisphenol A

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

Test Item(s)	CAS No.	Unit(s)	MDL	A2
Bisphenol A(BPA)	80-05-7	mg/kg	1.0	ND

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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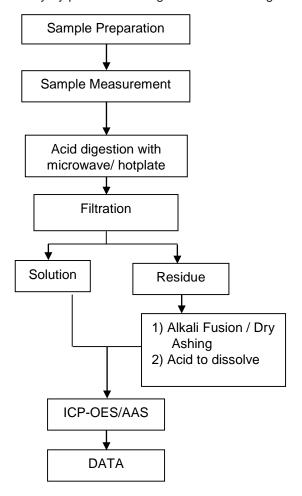
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Elements Testing Flow Chart

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





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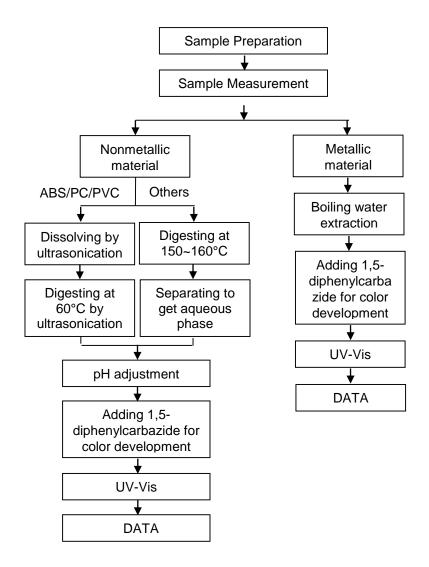
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Hexavalent Chromium (Cr(VI)) Testing Flow Chart





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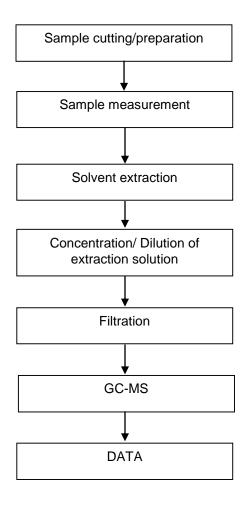
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PBB/PBDE Testing Flow Chart





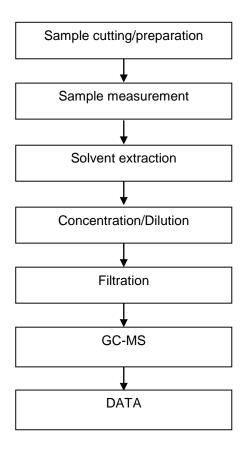
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Phthalates Testing Flow Chart





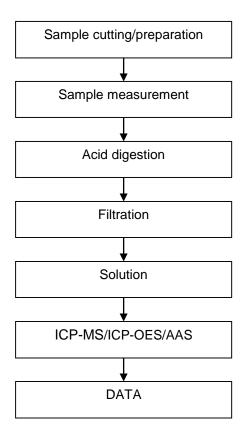
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Elements Testing Flow Chart





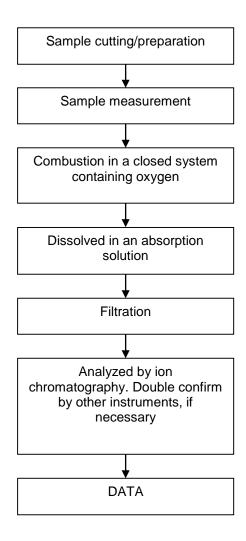
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Halogen Testing Flow Chart





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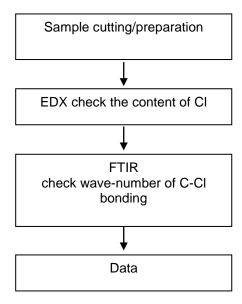
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PVC Testing Flow Chart





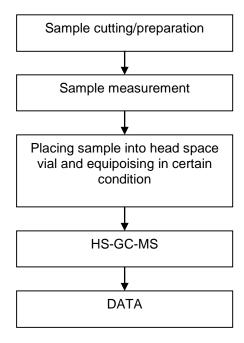
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VOC Testing Flow Chart





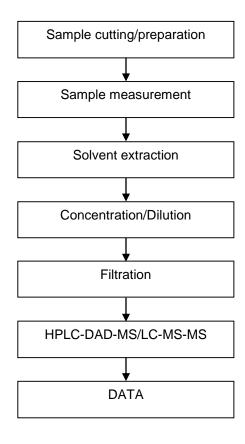
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BPA Testing Flow Chart





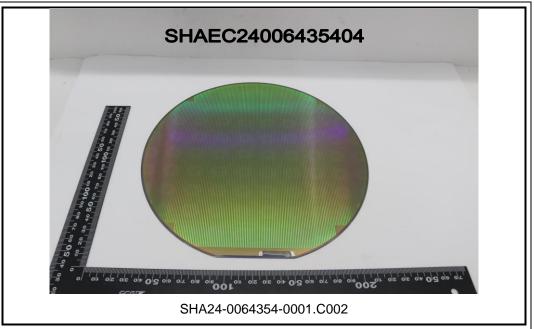
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Sample Photo:



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