

Restricted Chemicals Test Results

Device - UCC24624DR

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TI Report Number: 73864618

Component : Semiconductor Device

Analysis Type: RoHS 10 & Halogens

Analysis Date: 05/28/2024



Test Report No. Date: May 28, 2024 Page 1 of 10



This report supersedes all previous documents bearing the test report number

The following sample(s) was/were submitted and identified by/on behalf of the client as:

Sample Description: Standard TI Wafer

Sample Received Date: 05/16/2024

Testing Period: **05/16/2024 – 05/28/2024**

Revision Date : 05/28/2024

Revision Summary : Typo on Testing Period section revised from "06/16/2024 - 05/28/2024"

to "05/16/2024 - 05/28/2024".

Test Requested : Please refer to the result summary.

Test Method & Results : Please refer to next page(s).

Result Summary :

Test(s)	Requested	Conclusion
1.	RoHS Directive (EU) 2015/863 Amending Annex II to Directive 2011/65/EU	PASS
2.	Halogen Content	See Test Results
3.	Element Content (As Requested by Client)	See Test Results



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1. RoHS Directive (EU) 2015/863 Amending Annex II to Directive 2011/65/EU

Test Item(s):	Unit	Test Method	Result 1	MDL	Limit
Cadmium (Cd)	mg/kg	With reference to IEC 62321-5:2013	ND	2	100
Lead (Pb)	mg/kg	(Determination of Cd and Pb by ICP-OES and /or ICP-MS)	ND	2	1000
Mercury (Hg)	mg/kg	With reference to IEC 62321-4:2013+A1:2017 (Determination of Hg by ICP-OES and/ or ICP-MS)	ND	2	1000
Hexavalent Chromium (CrVI) #	mg/kg	With reference to IEC 62321-7-2:2017 (Determination of CrVI by UV-VIS)	ND*	8	
Sum of PBBs	mg/kg		ND	-	1000
Monobromobiphenyl	mg/kg		ND	5	-
Dibromobiphenyl	mg/kg		ND	5	-
Tribromobiphenyl	mg/kg		ND	5	-
Tetrabromobiphenyl	mg/kg		ND	5	-
Pentabromobiphenyl	mg/kg		ND	5	-
Hexabromobiphenyl	mg/kg		ND	5	-
Heptabromobiphenyl	mg/kg		ND	5	-
Octabromobiphenyl	mg/kg		ND	5	-
Nonabromobiphenyl	mg/kg	With reference to IEC	ND	5	-
Decabromobiphenyl	mg/kg	62321-6:2015	ND	5	-
Sum of PBDEs	mg/kg	(Determination of PBB and	ND	-	1000
Monobromodiphenyl ether	mg/kg	PBDE by GC-MS)	ND	5	-
Dibromodiphenyl ether	mg/kg		ND	5	-
Tribromodiphenyl ether	mg/kg		ND	5	-
Tetrabromodiphenyl ether	mg/kg		ND	5	-
Pentabromodiphenyl ether	mg/kg		ND	5	-
Hexabromodiphenyl ether	mg/kg		ND	5	-
Heptabromodiphenyl ether	mg/kg		ND	5	-
Octabromodiphenyl ether	mg/kg		ND	5	-
Nonabromodiphenyl ether	mg/kg		ND	5	-
Decabromodiphenyl ether	mg/kg		ND	5	-
Bis (2-ethylhexyl) Phthalate (DEHP)	mg/kg	IEC 62321-8:2017	ND	50	1000
Butyl Benzyl Phthalate (BBP)	mg/kg	(Determination of DEHP, BBP, DBP and DIBP by	ND	50	1000
Dibutyl Phthalate (DBP)	mg/kg	GC-MS)	ND	50	1000
Diisobutyl Phthalate (DIBP)	mg/kg	30 W3)	ND	50	1000
Conclusion	/	/	PASS	/	/

Sample Description:

1. Standard TI Wafer

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Note:

- (a) mg/kg = ppm; 0.1wt% = 1000ppm
- (b) ND= not detected
- (c) MDL = Method Detection Limit
- (d) # =
- The sample is positive for CrVI if the CrVI concentration is greater than 0.13 µg/cm2. The sample coating is considered to contain CrVI
- The sample is negative for CrVI if CrVI is ND (concentration less than 0.10 µg/cm2). The b. coating is considered a non-CrVI based coating.
- The result between 0.10 µg/cm2 and 0.13 µg/cm2 is considered to be inconclusive unavoidable coating variations may influence the determination.
- d. For corrosion protection coatings on metals: Information on storage conditions and production date of the tested sample is unavailable and thus results of Cr(VI) represent status of the sample at the time of testing represent status of the sample at the time of
- (e) = not regulated
- * = Total Chromium analysis by ICP-MS and/or ICP-OES was not detected in submitted sample. Therefore, Hexavalent Chromium determination using UV-Visible Spectroscopy was not
- (g) IEC 62321 series is equivalent to EN 62321 series http://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101::::FSP ORG ID,FSP LANG ID:

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2. Halogen Content

Test Method(s): With reference to IEC 62321-3-2:2020 "Determination of certain substances in electrotechnical products - Part 3-2: Screening - Fluorine, bromine and chlorine in polymer and electronics by combustion-ion chromatography (C-IC), and/or with reference to BS EN 14582:2016 - Analysis was performed by ion chromatography.

Test Item(s):	Unit	Results (ppm)	Reporting Limit (ppm)
Chlorine (CI)	mg/kg	ND	50
Bromine (Br)	mg/kg	ND	50
Fluorine (F)	mg/kg	ND	50

Sample Description:

1. Standard TI Wafer

Note: 1. ppm = parts per million

2. mg/kg = ppm

3. 1% = 10000 ppm (mg/kg)

4. ND = Not Detected, reported when the reading is less than the reporting limit value.

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3. Element Content (As Requested by Client)

Test Method: With reference to US EPA Method 3050B followed by analysis using ICP-MS.

Test Item		Result (mg/kg)	Reporting
rest item		1	Limit (mg/kg)
Arsenic	(As)	ND	5
Beryllium	(Be)	ND	5
Antimony	(Sb)	ND	5

Sample Description:

1. Standard TI Wafer

Note: 1. ppm = parts per million

2. mg/kg = ppm

3. 1% = 10000 ppm (mg/kg)

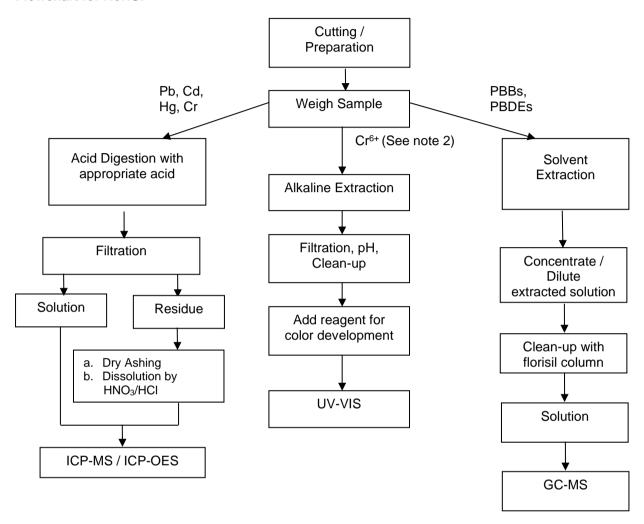
4. ND = Not Detected, reported when the reading is less than the reporting limit value.

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Flowchart for RoHS:



Note: 1. The Cr, Cd, Pb and Hg contents test on polymeric samples were dissolved totally by preconditioning method according to above flow chart.

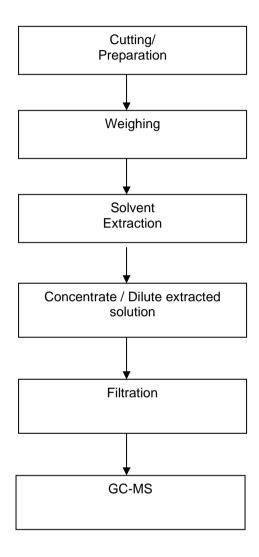
2. Cr⁶⁺ is performed only when total Cr is detected

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Flowchart for Phthalates:

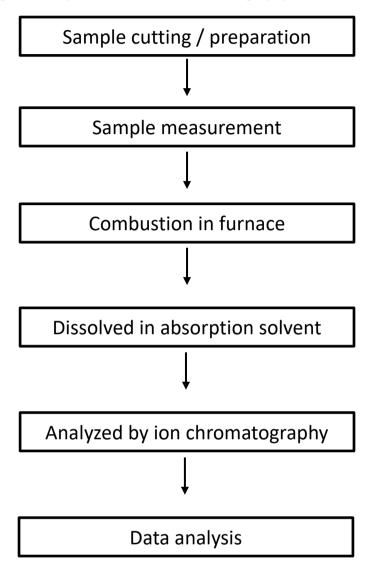


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Flow Chart of Halogen Test by Combustion Ion Chromatography:

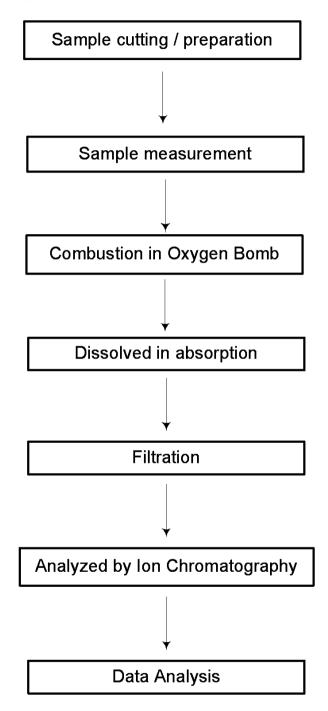


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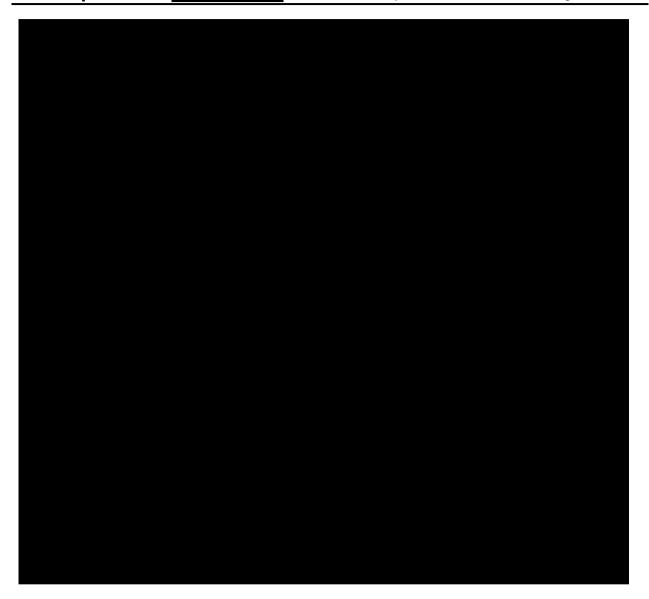
Halogen Testing Flow Chart (EN 14582):



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TI Report Number: 76624008

Component : Die Attach Adhesive

Analysis Type: RoHS 10

Analysis Date: 04/18/2024



Test Report No.: **Date:** Apr 18, 2024 Page 1 of 11

Client Name:

Client Address:

Sample Name:

Style/Item No.: Sample Description: Adhesive

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

SGS Job No.: SHP24-010526 Sample Receiving Date: Apr 11, 2024

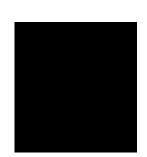
Testing Period: Apr 11, 2024 ~ Apr 18, 2024

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 Requested	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
Other items : - Hexabromocyclododecane (HBCDD) - Beryllium (Be) - Phthalates Content	See Results







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Test Result(s):

Test Part Description:

SN ID	Sample No.	SGS Sample ID	Description
SN1	A11	SHA24-0070636-0001.C011	Gray paste

Remarks:

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

Test Item(s)	Method	Unit	MDL	Result A11	Limit
Cadmium(Cd)	With reference to IEC 62321-5:2013, analysis was performed by ICP-OES.	mg/kg	2	ND	100
Lead(Pb)	With reference to IEC 62321-5:2013, analysis was performed by ICP-OES.	mg/kg	2	ND	1000
Mercury(Hg)	With reference to IEC 62321-4:2013+AMD1:2017, analysis was performed by ICP-OES.	mg/kg	2	ND	1000
Hexavalent Chromium(Cr(VI))	With reference to IEC 62321-7-2:2017, analysis was performed by UV-Vis.	mg/kg	8	ND	1000
Sum of PBBs	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	-	ND	1000
Monobromobiphenyl	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Dibromobiphenyl	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Tribromobiphenyl	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Tetrabromobiphenyl	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Pentabromobiphenyl	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Hexabromobiphenyl	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Heptabromobiphenyl	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-



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Test Item(s)	Method	Unit	MDL	Result A11	Limit
Octabromobiphenyl	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Nonabromobiphenyl	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Decabromobiphenyl	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Sum of PBDEs	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	-	ND	1000
Monobromodiphenyl ether	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Dibromodiphenyl ether	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Tribromodiphenyl ether	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Tetrabromodiphenyl ether	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Pentabromodiphenyl ether	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Hexabromodiphenyl ether	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Heptabromodiphenyl ether	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Octabromodiphenyl ether	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Nonabromodiphenyl ether	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Decabromodiphenyl ether	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Dibutyl phthalate (DBP)	With reference to IEC 62321-8:2017, analysis was performed by GC-MS.	mg/kg	50	ND	1000
Butyl benzyl phthalate (BBP)	With reference to IEC 62321-8:2017, analysis was performed by GC-MS.	mg/kg	50	ND	1000



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Test Item(s)	Method	Unit	MDL	Result A11	Limit
Bis (2-ethylhexyl) phthalate (DEHP)	With reference to IEC 62321-8:2017, analysis was performed by GC-MS.	mg/kg	50	ND	1000
Diisobutyl Phthalates (DIBP)	With reference to IEC 62321-8:2017, analysis was performed by GC-MS.	mg/kg	50	ND	1000

Test Item(s)	Method	Unit	MDL	Result A11	Limit
Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α-HBCDD, β-HBCDD, γ-HBCDD)	With reference to IEC 62321- 9:2021, analysis was performed by GC-MS.	mg/kg	20	ND	-
Beryllium (Be)	With reference to US EPA 3052:1996, analysis was performed by ICP-OES/AAS.	mg/kg	2	ND	-
Diisononyl Phthalate (DINP)	With reference to IEC 62321-8:2017, analysis was performed by GC-MS.	mg/kg	50	ND	-
Di-n-octyl Phthalate (DNOP)	With reference to IEC 62321-8:2017, analysis was performed by GC-MS.	mg/kg	50	ND	-
Diisodecyl Phthalate (DIDP)	With reference to IEC 62321-8:2017, analysis was performed by GC-MS.	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.



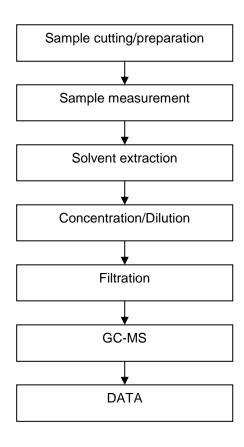
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HBCDD Testing Flow Chart





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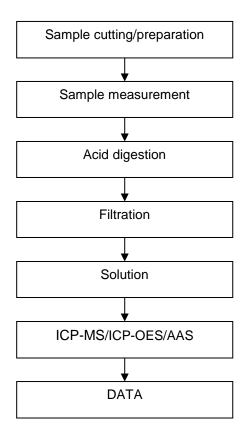
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Elements Testing Flow Chart





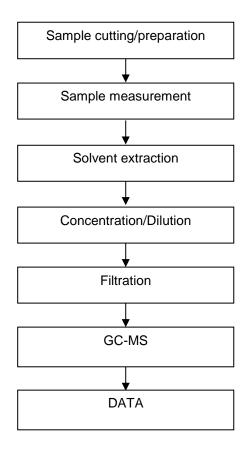
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Phthalates Testing Flow Chart





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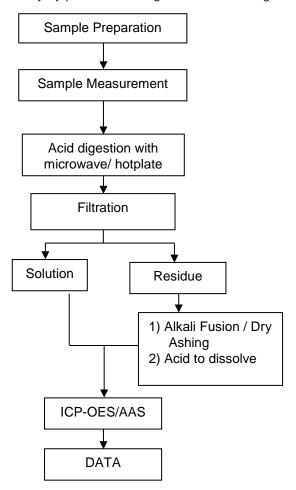
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Elements Testing Flow Chart

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





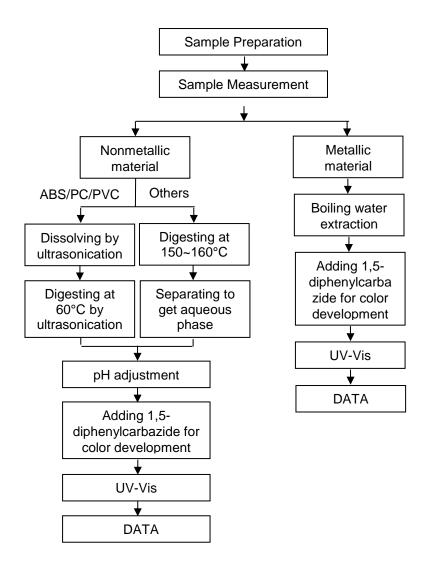
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Hexavalent Chromium (Cr(VI)) Testing Flow Chart





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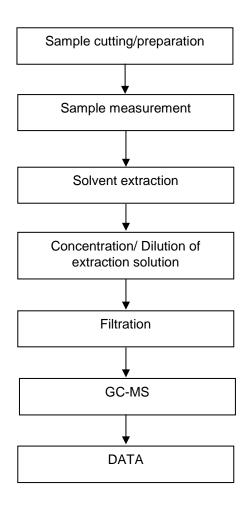


No.:

Test Report ATTACHMENTS

Date: Apr 18, 2024 Page 10 of 11

PBB/PBDE Testing Flow Chart





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Test Report	No.:	Date:	Apr 18, 2024	Page 11 of 11

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TI Report Number: 76624004

Component : Die Attach Adhesive

Analysis Type: Halogens

Analysis Date: 04/18/2024



Test Report No.: **Date:** Apr 18, 2024 Page 1 of 4

Client Name:

Client Address:

Sample Name: Style/Item No.:

Sample Description: Adhesive

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

SGS Job No.: SHP24-010526 Sample Receiving Date: Apr 11, 2024

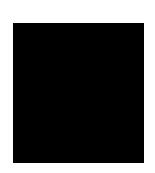
Testing Period: Apr 11, 2024 ~ Apr 18, 2024

Select test(s) as requested by the client. Test Requested:

Test Method(s): Please refer to next page(s). Please refer to next page(s). Test Result(s):

Test Requested	Conclusion
Other items : - Perfluorooctane Sulfonates (PFOS) and Perfluorooctanoic Acid (PFOA)	See Results







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e sgs.china@sgs.com



Test Report	l No.: ■	Date:	Apr 18, 2024	Page 2 of 4

Test Result(s):

Test Part Description:

SN ID	Sample No.	SGS Sample ID	Description
SN1	A11	SHA24-0070636-0001.C011	Gray paste

Remarks:

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

Test Item(s)	Method	Unit	MDL	Result A11	Limit
Perfluorooctanesulfonate (PFOS) and its salts^	With reference to CEN/TS 15968:2010, analysis was performed by LC-MS or LC- MS-MS.	mg/kg	0.010	ND	-
Perfluorooctanoic Acid (PFOA) and its salts+	With reference to CEN/TS 15968:2010, analysis was performed by LC-MS or LC- MS-MS.	mg/kg	0.010	ND	-

Notes:

(1) ^ PFOS including PFOS-K (CAS No.: 2795-39-3), PFOS-Li (CAS No.: 29457-72-5), PFOS-NH4 (CAS No.: 29081-56-9), PFOS-NH(OH)2 (CAS No.: 70225-14-8), PFOS-N(C2H5)4 (CAS No.: 56773-42-3), PFOS-DDA(CAS No.: 251099-16-8) and POSF (CAS No.: 307-35-7).

(2) + PFOA refer to 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).

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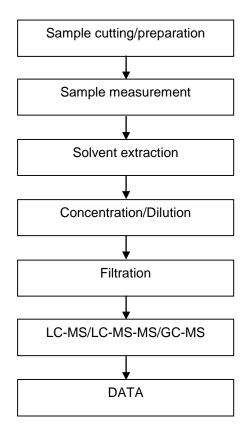
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Date: Apr 18, 2024 Page 3 of 4

PFASs/ PFOS/PFOA Testing Flow Chart





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Test Report No.: Page 4 of 4 **Date:** Apr 18, 2024

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TI Report Number: 76624006

Component : Die Attach Adhesive

Analysis Type: Halogens

Analysis Date: 04/18/2024



Test Report Date: Apr 18, 2024 Page 1 of 4 No.:

Client Name:

Client Address:

Sample Name: Style/Item No.:

Sample Description: Adhesive

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

SGS Job No.: SHP24-010526 Sample Receiving Date: Apr 11, 2024

Testing Period: Apr 11, 2024 ~ Apr 18, 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 Requested	Conclusion
Other items : - Halogen	See Results







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Tes	t Report	No.:	Date:	Apr 18, 2024	Page 2 of 4
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Test Result(s):

Test Part Description:

SN ID	Sample No.	SGS Sample ID	Description
SN1	A11	SHA24-0070636-0001.C011	Gray paste

Remarks:

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

Test Item(s)	Method	Unit	MDL	Result A11	Limit
Fluorine (F)	With reference to EN 14582:2016, analysis was performed by IC.	mg/kg	50	ND	-
Chlorine (CI)	With reference to EN 14582:2016, analysis was performed by IC.	mg/kg	50	ND	-
Bromine (Br)	With reference to EN 14582:2016, analysis was performed by IC.	mg/kg	50	ND	-
lodine (I)	With reference to EN 14582:2016, analysis was performed by IC.	mg/kg	50	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.



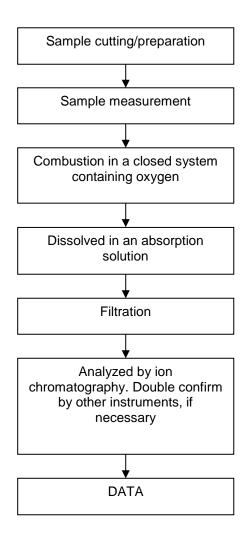
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Date: Apr 18, 2024 Page 3 of 4 No.:

Halogen Testing Flow Chart





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Test Report	No.:		Date:	Apr 18, 2024	Page 4 of 4
		*** End of Report *	***		



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TI Report Number: 76624010

Component : Die Attach Adhesive

Analysis Type: Halogens

Analysis Date: 04/18/2024



Test Report Date: Apr 18, 2024 Page 1 of 4 No.:

Client Name:

Client Address:

Sample Name: Style/Item No.:

Sample Description: Adhesive

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

SGS Job No.: SHP24-010526 Sample Receiving Date: Apr 11, 2024

Testing Period: Apr 11, 2024 ~ Apr 18, 2024

Select test(s) as requested by the client. Test Requested:

Test Method(s): Please refer to next page(s). Please refer to next page(s). Test Result(s):

Test Requested	Conclusion
Other items : - Phosphorus (P)	See Results







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Test Report No.: Page 2 of 4 **Date:** Apr 18, 2024

Test Result(s):

Test Part Description:

SN ID	Sample No.	SGS Sample ID	Description
SN1	A11	SHA24-0070636-0001.C011	Gray paste

Remarks:

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

Test Item(s)	Method	Unit	MDL	Result A11	Limit
Phosphorus (P)	With reference to US EPA 3052:1996, analysis was performed by ICP-OES/AAS.	mg/kg	2	ND	-

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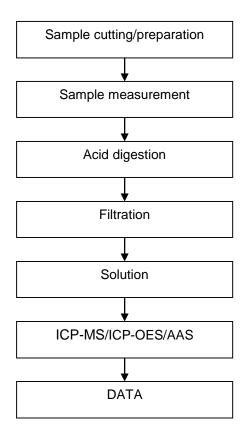


Test Report ATTACHMENTS

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Date: Apr 18, 2024 Page 3 of 4

Elements Testing Flow Chart





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Test Report	No.:	Date: Apr 18, 2024	Page 4 of 4

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TI Report Number: 76624012

Component : Die Attach Adhesive

Analysis Type: Halogens

Analysis Date: 04/18/2024



Test Report Date: Apr 18, 2024 Page 1 of 4 No.:

Client Name:

Client Address:

Sample Name: Style/Item No.:

Sample Description: Adhesive

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

SGS Job No.: SHP24-010526 Sample Receiving Date: Apr 11, 2024

Testing Period: Apr 11, 2024 ~ Apr 18, 2024

Select test(s) as requested by the client. Test Requested:

Test Method(s): Please refer to next page(s). Please refer to next page(s). Test Result(s):

Test Requested	Conclusion
Other items : - Antimony (Sb)	See Results







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Test Report No.: Page 2 of 4 **Date:** Apr 18, 2024

Test Result(s):

Test Part Description:

SN ID	Sample No.	SGS Sample ID	Description
SN1	A11	SHA24-0070636-0001.C011	Gray paste

Remarks:

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

Test Item(s)	Method	Unit	MDL	Result A11	Limit
Antimony (Sb)	With reference to US EPA 3052:1996, analysis was performed by ICP-OES/AAS.	mg/kg	2	ND	-

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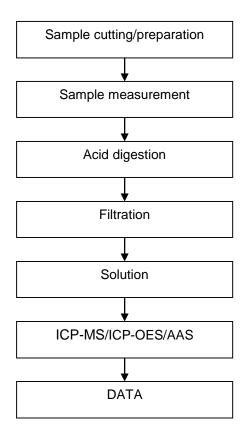


Test Report ATTACHMENTS

No.:

Date: Apr 18, 2024 Page 3 of 4

Elements Testing Flow Chart





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TI Report Number: 64162438

Component: Lead Frame

Analysis Type: RoHS 10 & Halogens

Analysis Date: 10/31/2023





Date: 31-Oct-2023 Page: 1 of 18

The following sample(s) was/were submitted and identified by the applicant as:

Sample Submitted By

Sample Name

Sample Receiving Date

23-Oct-2023

Testing Period

23-Oct-2023 to 31-Oct-2023

Test Requested

(1) As specified by client, with reference to RoHS 2011/65/EU Annex II and amending Directive (EU) 2015/863 to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP contents in the submitted sample(s).

(2) Please refer to next pages for the other item(s).

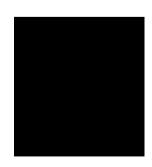
Test Results

Please refer to following pages.

Conclusion

(1) Based on the performed tests on submitted sample(s), the test results of Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.





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Date: 31-Oct-2023

Page: 2 of 18

Test Part Description

No.1 : COPPER COLORED METAL

Test Result(s)

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	•
Cadmium (Cd)	With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.	mg/kg	2	n.d.	100
Lead (Pb)	With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.	mg/kg	2	n.d.	1000
Mercury (Hg)	With reference to IEC 62321-4: 2013+ AMD1: 2017, analysis was performed by ICP-OES.	mg/kg	2	n.d.	1000
Hexavalent Chromium Cr(VI) (#2)	With reference to IEC 62321-7-1: 2015, analysis was performed by UV-VIS.	μg/cm²	0.1	n.d.	-
Monobromobiphenyl		mg/kg	5	n.d.	-
Dibromobiphenyl		mg/kg	5	n.d.	=
Tribromobiphenyl		mg/kg	5	n.d.	-
Tetrabromobiphenyl		mg/kg	5	n.d.	-
Pentabromobiphenyl		mg/kg	5	n.d.	-
Hexabromobiphenyl		mg/kg	5	n.d.	-
Heptabromobiphenyl		mg/kg	5	n.d.	-
Octabromobiphenyl		mg/kg	5	n.d.	-
Nonabromobiphenyl		mg/kg	5	n.d.	-
Decabromobiphenyl		mg/kg	5	n.d.	-
Sum of PBBs	With reference to IEC 62321-6: 2015,	mg/kg	-	n.d.	1000
Monobromodiphenyl ether	analysis was performed by GC/MS.	mg/kg	5	n.d.	-
Dibromodiphenyl ether		mg/kg	5	n.d.	-
Tribromodiphenyl ether		mg/kg	5	n.d.	-
Tetrabromodiphenyl ether		mg/kg	5	n.d.	-
Pentabromodiphenyl ether		mg/kg	5	n.d.	-
Hexabromodiphenyl ether		mg/kg	5	n.d.	-
Heptabromodiphenyl ether		mg/kg	5	n.d.	-
Octabromodiphenyl ether		mg/kg	5	n.d.	-
Nonabromodiphenyl ether		mg/kg	5	n.d.	-
Decabromodiphenyl ether		mg/kg	5	n.d.	-
Sum of PBDEs		mg/kg	-	n.d.	1000

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Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	·
Butyl benzyl phthalate (BBP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Dibutyl phthalate (DBP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Di-(2-ethylhexyl) phthalate (DEHP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Diisobutyl phthalate (DIBP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Diisodecyl phthalate (DIDP) (CAS No.: 26761-40-0, 68515-49-1)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Diisononyl phthalate (DINP) (CAS No.: 28553-12-0, 68515-48-0)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Di-n-octyl phthalate (DNOP) (CAS No.: 117-84-0)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Bis(2-methoxyethyl) phthalate (DMEP) (CAS No.: 117-82-8)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Di-n-pentyl phthalate (DNPP) (CAS No.: 131-18-0)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Di-n-hexyl phthalate (DNHP) (CAS No.: 84-75-3)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
1,2-Benzenedicarboxylic acid, di-C6- 8-branched alkyl esters, C7-rich (DIHP) (CAS No.: 71888-89-6)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
1,2-Benzenedicarboxylic acid, di-C7- 11-branched and linear alkyl esters (DHNUP) (CAS No.: 68515-42-4)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	
Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α - HBCDD, β - HBCDD, γ - HBCDD) (CAS No.: 25637-99-4, 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	With reference to IEC 62321-9: 2021, analysis was performed by GC/MS.	mg/kg	20	n.d.	-

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Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Fluorine (F) (CAS No.: 14762-94-8)	With reference to BS EN 14582: 2016,	mg/kg	50	n.d.	-
	analysis was performed by IC.				
Chlorine (Cl) (CAS No.: 22537-15-1)	With reference to BS EN 14582: 2016,	mg/kg	50	n.d.	-
	analysis was performed by IC.				
Bromine (Br) (CAS No.: 10097-32-2)	With reference to BS EN 14582: 2016,	mg/kg	50	n.d.	-
	analysis was performed by IC.				
lodine (I) (CAS No.: 14362-44-8)	With reference to BS EN 14582: 2016,	mg/kg	50	n.d.	-
	analysis was performed by IC.				
PFOS and its salts (CAS No.: 1763-	With reference to CEN/TS 15968: 2010,	mg/kg	0.01	n.d.	-
23-1 and its salts)	analysis was performed by LC/MS/MS.				
PFOA and its salts (CAS No.: 335-67-	With reference to CEN/TS 15968: 2010,	mg/kg	0.01	n.d.	-
1 and its salts)	analysis was performed by LC/MS/MS.				
Polyvinyl chloride (PVC)	With reference to ASTM E1252: 2021,	**	-	Negative	-
	analysis was performed by FT-IR and				
	Flame Test.				
Polychlorinated biphenyls (PCBs)	With reference to US EPA 3550C: 2007,	mg/kg	0.5	n.d.	-
	analysis was performed by GC/MS.				
Polychlorinated naphthalene (PCNs)	With reference to US EPA 3550C: 2007,	mg/kg	5	n.d.	-
	analysis was performed by GC/MS.				
Polychlorinated terphenyls (PCTs)	With reference to US EPA 3550C: 2007,	mg/kg	0.5	n.d.	-
	analysis was performed by GC/MS.				
Short Chain Chlorinated	With reference to ISO 18219-1: 2021,	mg/kg	50	n.d.	-
Paraffins(C10-C13) (SCCP) (CAS No.:	analysis was performed by GC/MS.				
85535-84-8)					
Tributyl tin (TBT)	With reference to ISO 17353: 2004,	mg/kg	0.03	n.d.	-
	analysis was performed by GC/FPD.				
Bis(tributyltin) oxide (TBTO) (CAS	Calculated from the result of Tributyl	mg/kg	0.03 🛦	n.d.	-
No.: 56-35-9)	Tin (TBT).				
Triphenyl tin (TPT)	With reference to ISO 17353: 2004,	mg/kg	0.03	n.d.	1
	analysis was performed by GC/FPD.				
Dibutyl tin (DBT)	With reference to ISO 17353: 2004,	mg/kg	0.03	n.d.	-
	analysis was performed by GC/FPD.				
Dioctyl tin (DOT)	With reference to ISO 17353: 2004,	mg/kg	0.03	n.d.	-
	analysis was performed by GC/FPD.				
Bisphenol A (CAS No.: 80-05-7)	With reference to RSTS-CHEM-239-1,	mg/kg	1	n.d.	-
	analysis was performed by LC/MS/MS.				

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Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Antimony (Sb) (CAS No.: 7440-36-0)	With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.	mg/kg	2	n.d.	-
Beryllium (Be) (CAS No.: 7440-41-7)	With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.	mg/kg	2	n.d.	-
Arsenic (As) (CAS No.: 7440-38-2)	With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.	mg/kg	2	n.d.	-

Note:

- 1. mg/kg = ppm; 0.1wt% = 0.1% = 1000ppm
- 2. MDL = Method Detection Limit
- 3. n.d. = Not Detected (Less than MDL)
- 4. "-" = Not Regulated
- 5. **= Qualitative analysis (No Unit)
- 6. Negative = Undetectable; Positive = Detectable
- 7.(#2) =
 - a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 μ g/cm². The sample coating is considered to contain Cr(VI).
 - b. The sample is negative for Cr(VI) if Cr(VI) is n.d. (concentration less than 0.10 μ g/cm²). The coating is considered a non-Cr(VI) based coating
 - c. The result between 0.10 μ g/cm² and 0.13 μ g/cm² is considered to be inconclusive unavoidable coating variations may influence the determination.
- 8. ▲ : The MDL was evaluated for element / tested substance.

Conversion Formula : $AX = A \times F$

AX	Α	F
Bis(tributyltin)oxide (TBTO)	Tributyl Tin (TBT)	1.0276

Parameter Conversion Table: https://eecloud.sgs.com/Region TW/DocDownload.aspx?name=Others

- 9. 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. According to this rule, the judgement of conformity is based on the comparing test results with limits.
- 10. This is the additional test report of ETR23A04238.

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PFAS Remark:

The quantitative technology of PFAS is to analyze the specific structure of PFAS substances. However, PFAS acid and its salts with the same carbon number group have the same specific structure that can be identified. The tested results of the analyzed specific structure cannot be distinguished to identify the contribution from PFAS acid or its salts. Therefore, the tested results display the sum of concentrations of PFAS acids and its salts with the same carbon number group. The concentration of PFAS substances in the below table have been included in the tested results, please refer to the table for relevant information: (The listed PFAS substances are examples only, it do not include all PFAS salts with the same carbon number group.)

Classification of Substance Concentration	Substance Name	CAS No.
Perfluorooctane sulfonates and	Potassium perfluorooctanesulfonate (PFOS-K)	2795-39-3
its salts (PFOS and its salts)	Perfluorooctanesulfonic acid, lithium salt (PFOS-Li)	29457-72-5
(CAS No.: 1763-23-1 and its salts)	Perfluorooctanesulfonic acid, ammonium salt (PFOS- $\mathrm{NH_4}$)	29081-56-9
	Perfluorooctane sulfonate diethanolamine salt (PFOS-NH(OH) ₂)	70225-14-8
	Perfluorooctanesulfonic acid, tetraethylammonium salt (PFOS-N(C_2H_5) ₄)	56773-42-3
	N-decyl-N,N-dimethyldecan-1-aminium 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluorooctane- 1-sulfonate (PFOS-DDA)	251099-16-8
	Perfluorooctane sulfonyl fluoride (POSF)	307-35-7
Perfluorooctane sulfonates and its salts (PFOS and its salts)	Perfluorooctanesulfonic acid, magnesium salt (PFOS-Mg)	91036-71-4
(CAS No.: 1763-23-1 and its salts)	Perfluorooctanesulfonic acid, sodium salt (PFOS-Na)	4021-47-0
Perfluorooctanoic acid and its	Sodium perfluorooctanoate (PFOA-Na)	335-95-5
salts (PFOA and its salts)	Potassium perfluorooctanoate (PFOA-K)	2395-00-8
(CAS No.: 335-67-1 and its salts)	Silver perfluorooctanote (PFOA-Ag)	335-93-3
	Perfluorooctanoyl fluoride (PFOA-F)	335-66-0
	Ammonium pentadecafluorooctanoate (APFO)	3825-26-1
	Lithium perfluorooctanoate (PFOA-Li)	17125-58-5

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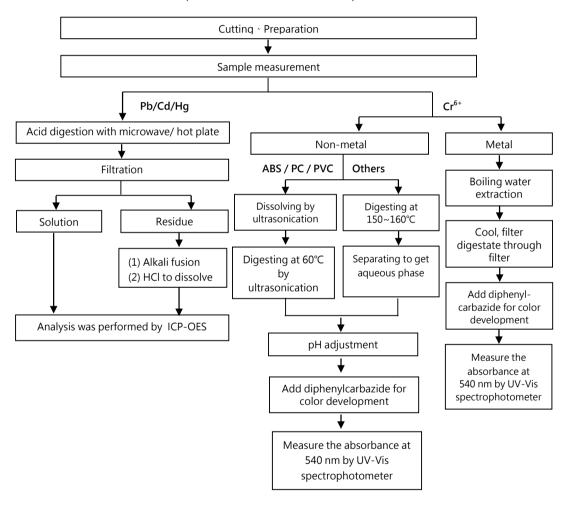


.: Date: 31-Oct-2023

Analytical flow chart of heavy metal

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

(Cr⁶⁺ test method excluded)



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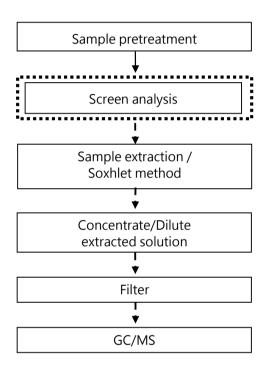
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Analytical flow chart – PBBs / PBDEs

First testing process

Optional screen process

Confirmation process



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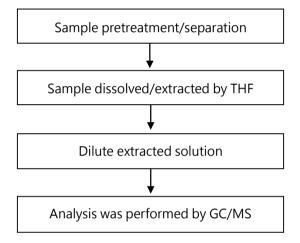
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Analytical flow chart - Phthalate

[Test method: IEC 62321-8]



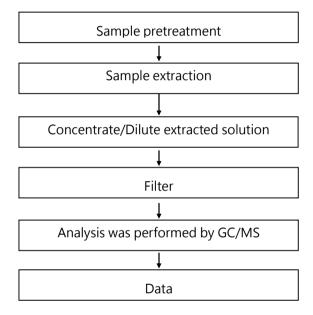
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Analytical flow chart - HBCDD



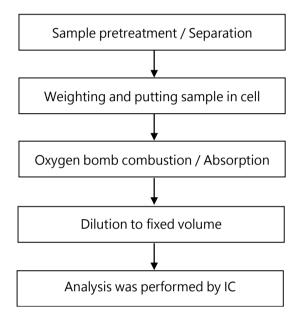
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Analytical flow chart - Halogen



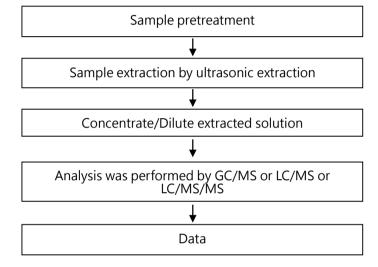
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Analytical flow chart – PFAS (including PFOA/PFOS/its related compound, etc.)



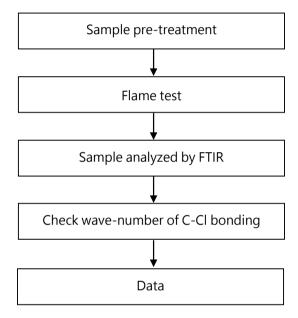
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Analysis flow chart - PVC



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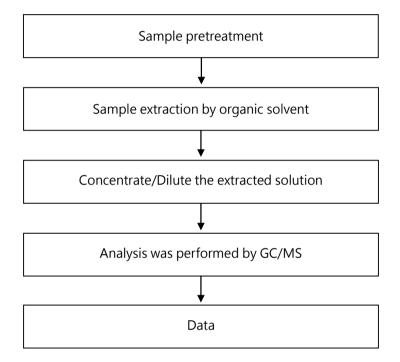
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Analytical flow chart

* Apply to: PCBs, PCNs, PCTs, Mirex, Chlorinated Paraffins, DBBT



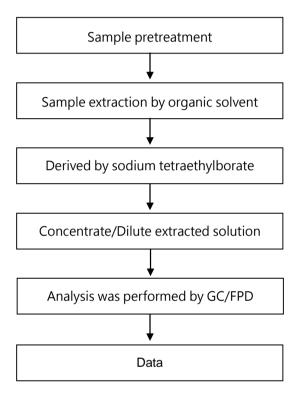
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Analytical flow chart - Organic-Tin



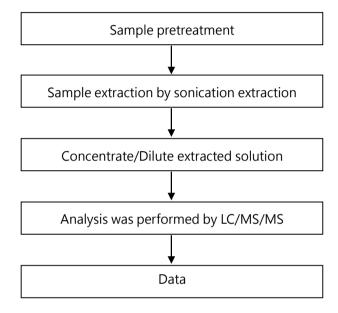
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Analytical flow chart - Bisphenol A



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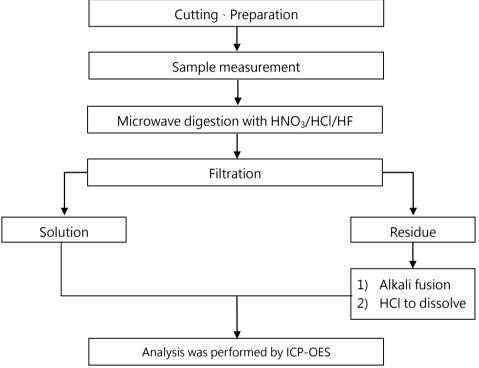


Date: 31-Oct-2023

Analytical flow chart of elements (Heavy metal included)

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

【Reference method: US EPA 3051A \ US EPA 3052】



* US EPA 3051A method does not add HF.

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* The tested sample / part is marked by an arrow if it's shown on the photo. *



** End of Report **

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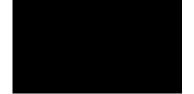
TI Report Number: 64162365

Component: Lead Frame Plating

Analysis Type: RoHS 10 & Halogens

Analysis Date: 10/31/2023





Date: 31-Oct-2023

Page: 1 of 18

The following sample(s) was/were submitted and identified by the applicant as:

Sample Submitted By

:

Sample Name

Ni PLATING

Sample Receiving Date

23-Oct-2023

Testing Period

: 23-Oct-2023 to 31-Oct-2023

Test Requested

(1) As specified by client, with reference to RoHS 2011/65/EU Annex II and amending Directive (EU) 2015/863 to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP contents in the submitted sample(s).

(2) Please refer to next pages for the other item(s).

Test Results

Please refer to following pages.

Conclusion

(1) Based on the performed tests on submitted sample(s), the test results of Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.





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Date: 31-Oct-2023

Test Part Description

No.1 : SILVER COLORED METAL

Test Result(s)

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Cadmium (Cd)	With reference to IEC 62321-5: 2013,	mg/kg	2	n.d.	100
	analysis was performed by ICP-OES.				
Lead (Pb)	With reference to IEC 62321-5: 2013,	mg/kg	2	n.d.	1000
	analysis was performed by ICP-OES.				
Mercury (Hg)	With reference to IEC 62321-4: 2013+	mg/kg	2	n.d.	1000
	AMD1: 2017, analysis was performed				
	by ICP-OES.				
Hexavalent Chromium Cr(VI) (#2)	With reference to IEC 62321-7-1: 2015,	μg/cm²	0.1	n.d.	-
	analysis was performed by UV-VIS.				
Monobromobiphenyl		mg/kg	5	n.d.	-
Dibromobiphenyl		mg/kg	5	n.d.	=
Tribromobiphenyl		mg/kg	5	n.d.	-
Tetrabromobiphenyl		mg/kg	5	n.d.	-
Pentabromobiphenyl		mg/kg	5	n.d.	-
Hexabromobiphenyl		mg/kg	5	n.d.	-
Heptabromobiphenyl		mg/kg	5	n.d.	-
Octabromobiphenyl		mg/kg	5	n.d.	-
Nonabromobiphenyl		mg/kg	5	n.d.	-
Decabromobiphenyl		mg/kg	5	n.d.	-
Sum of PBBs	With reference to IEC 62321-6: 2015,	mg/kg	=	n.d.	1000
Monobromodiphenyl ether	analysis was performed by GC/MS.	mg/kg	5	n.d.	-
Dibromodiphenyl ether		mg/kg	5	n.d.	-
Tribromodiphenyl ether		mg/kg	5	n.d.	-
Tetrabromodiphenyl ether		mg/kg	5	n.d.	-
Pentabromodiphenyl ether		mg/kg	5	n.d.	-
Hexabromodiphenyl ether		mg/kg	5	n.d.	-
Heptabromodiphenyl ether	7	mg/kg	5	n.d.	-
Octabromodiphenyl ether		mg/kg	5	n.d.	-
Nonabromodiphenyl ether		mg/kg	5	n.d.	-
Decabromodiphenyl ether	7	mg/kg	5	n.d.	-
Sum of PBDEs		mg/kg	-	n.d.	1000

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Date: 31-Oct-2023

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	·
Butyl benzyl phthalate (BBP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Dibutyl phthalate (DBP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Di-(2-ethylhexyl) phthalate (DEHP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Diisobutyl phthalate (DIBP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Diisodecyl phthalate (DIDP) (CAS No.: 26761-40-0, 68515-49-1)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Diisononyl phthalate (DINP) (CAS No.: 28553-12-0, 68515-48-0)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Di-n-octyl phthalate (DNOP) (CAS No.: 117-84-0)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Bis(2-methoxyethyl) phthalate (DMEP) (CAS No.: 117-82-8)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Di-n-pentyl phthalate (DNPP) (CAS No.: 131-18-0)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Di-n-hexyl phthalate (DNHP) (CAS No.: 84-75-3)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
1,2-Benzenedicarboxylic acid, di-C6- 8-branched alkyl esters, C7-rich (DIHP) (CAS No.: 71888-89-6)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
1,2-Benzenedicarboxylic acid, di-C7- 11-branched and linear alkyl esters (DHNUP) (CAS No.: 68515-42-4)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	
Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α - HBCDD, β - HBCDD, γ - HBCDD) (CAS No.: 25637-99-4, 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	With reference to IEC 62321-9: 2021, analysis was performed by GC/MS.	mg/kg	20	n.d.	-

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Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Fluorine (F) (CAS No.: 14762-94-8)	With reference to BS EN 14582: 2016,	mg/kg	50	n.d.	-
	analysis was performed by IC.				
Chlorine (Cl) (CAS No.: 22537-15-1)	With reference to BS EN 14582: 2016,	mg/kg	50	n.d.	-
	analysis was performed by IC.				
Bromine (Br) (CAS No.: 10097-32-2)	With reference to BS EN 14582: 2016,	mg/kg	50	n.d.	-
	analysis was performed by IC.				
lodine (I) (CAS No.: 14362-44-8)	With reference to BS EN 14582: 2016,	mg/kg	50	n.d.	-
	analysis was performed by IC.				
PFOS and its salts (CAS No.: 1763-	With reference to CEN/TS 15968: 2010,	mg/kg	0.01	n.d.	-
23-1 and its salts)	analysis was performed by LC/MS/MS.				
PFOA and its salts (CAS No.: 335-67-	With reference to CEN/TS 15968: 2010,	mg/kg	0.01	n.d.	=
1 and its salts)	analysis was performed by LC/MS/MS.				
Polyvinyl chloride (PVC)	With reference to ASTM E1252: 2021,	**	-	Negative	-
	analysis was performed by FT-IR and				
	Flame Test.				
Polychlorinated biphenyls (PCBs)	With reference to US EPA 3550C: 2007,	mg/kg	0.5	n.d.	-
	analysis was performed by GC/MS.				
Polychlorinated naphthalene (PCNs)	With reference to US EPA 3550C: 2007,	mg/kg	5	n.d.	-
	analysis was performed by GC/MS.				
Polychlorinated terphenyls (PCTs)	With reference to US EPA 3550C: 2007,	mg/kg	0.5	n.d.	-
	analysis was performed by GC/MS.				
Short Chain Chlorinated	With reference to ISO 18219-1: 2021,	mg/kg	50	n.d.	-
Paraffins(C10-C13) (SCCP) (CAS No.:	analysis was performed by GC/MS.				
85535-84-8)					
Tributyl tin (TBT)	With reference to ISO 17353: 2004,	mg/kg	0.03	n.d.	=
	analysis was performed by GC/FPD.				
Bis(tributyltin) oxide (TBTO) (CAS	Calculated from the result of Tributyl	mg/kg	0.03 ▲	n.d.	-
No.: 56-35-9)	Tin (TBT).				
Triphenyl tin (TPT)	With reference to ISO 17353: 2004,	mg/kg	0.03	n.d.	-
	analysis was performed by GC/FPD.				
Dibutyl tin (DBT)	With reference to ISO 17353: 2004,	mg/kg	0.03	n.d.	=
	analysis was performed by GC/FPD.				
Dioctyl tin (DOT)	With reference to ISO 17353: 2004,	mg/kg	0.03	n.d.	-
	analysis was performed by GC/FPD.				
Bisphenol A (CAS No.: 80-05-7)	With reference to RSTS-CHEM-239-1,	mg/kg	1	n.d.	-
	analysis was performed by LC/MS/MS.				

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Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Antimony (Sb) (CAS No.: 7440-36-0)	With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.	mg/kg	2	n.d.	-
Beryllium (Be) (CAS No.: 7440-41-7)	With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.	mg/kg	2	n.d.	-
Arsenic (As) (CAS No.: 7440-38-2)	With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.	mg/kg	2	n.d.	-

Note:

- 1. mg/kg = ppm; 0.1wt% = 0.1% = 1000ppm
- 2. MDL = Method Detection Limit
- 3. n.d. = Not Detected (Less than MDL)
- 4. "-" = Not Regulated
- 5. **= Qualitative analysis (No Unit)
- 6. Negative = Undetectable; Positive = Detectable
- 7.(#2) =
 - a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 μ g/cm². The sample coating is considered to contain Cr(VI).
 - b. The sample is negative for Cr(VI) if Cr(VI) is n.d. (concentration less than 0.10 μ g/cm²). The coating is considered a non-Cr(VI) based coating
 - c. The result between 0.10 μ g/cm² and 0.13 μ g/cm² is considered to be inconclusive unavoidable coating variations may influence the determination.
- 8. ▲ : The MDL was evaluated for element / tested substance.

Conversion Formula : $AX = A \times F$

AX	Α	F
Bis(tributyltin)oxide (TBTO)	Tributyl Tin (TBT)	1.0276

Parameter Conversion Table: https://eecloud.sgs.com/Region_TW/DocDownload.aspx?name=Others

9. 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. According to this rule, the judgement of conformity is based on the comparing test results with limits.

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: Date: 31-Oct-2023

PFAS Remark:

The quantitative technology of PFAS is to analyze the specific structure of PFAS substances. However, PFAS acid and its salts with the same carbon number group have the same specific structure that can be identified. The tested results of the analyzed specific structure cannot be distinguished to identify the contribution from PFAS acid or its salts. Therefore, the tested results display the sum of concentrations of PFAS acids and its salts with the same carbon number group. The concentration of PFAS substances in the below table have been included in the tested results, please refer to the table for relevant information: (The listed PFAS substances are examples only, it do not include all PFAS salts with the same carbon number group.)

Classification of Substance Concentration	Substance Name	CAS No.
Perfluorooctane sulfonates and	Potassium perfluorooctanesulfonate (PFOS-K)	2795-39-3
its salts (PFOS and its salts)	Perfluorooctanesulfonic acid, lithium salt (PFOS-Li)	29457-72-5
(CAS No.: 1763-23-1 and its salts)	Perfluorooctanesulfonic acid, ammonium salt (PFOS-NH ₄)	29081-56-9
	Perfluorooctane sulfonate diethanolamine salt (PFOS-NH(OH) ₂)	70225-14-8
	Perfluorooctanesulfonic acid, tetraethylammonium salt (PFOS-N(C_2H_5) ₄)	56773-42-3
	N-decyl-N,N-dimethyldecan-1-aminium 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluorooctane- 1-sulfonate (PFOS-DDA)	251099-16-8
	Perfluorooctane sulfonyl fluoride (POSF)	307-35-7
Perfluorooctane sulfonates and its salts (PFOS and its salts)	Perfluorooctanesulfonic acid, magnesium salt (PFOS-Mg)	91036-71-4
(CAS No.: 1763-23-1 and its salts)	Perfluorooctanesulfonic acid, sodium salt (PFOS-Na)	4021-47-0
Perfluorooctanoic acid and its	Sodium perfluorooctanoate (PFOA-Na)	335-95-5
salts (PFOA and its salts) (CAS No.: 335-67-1 and its salts)	Potassium perfluorooctanoate (PFOA-K)	2395-00-8
	Silver perfluorooctanote (PFOA-Ag)	335-93-3
	Perfluorooctanoyl fluoride (PFOA-F)	335-66-0
	Ammonium pentadecafluorooctanoate (APFO)	3825-26-1
	Lithium perfluorooctanoate (PFOA-Li)	17125-58-5

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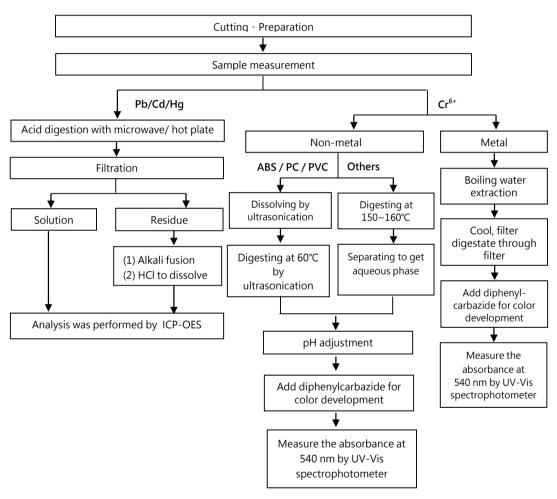


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Analytical flow chart of heavy metal

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

(Cr⁶⁺ test method excluded)



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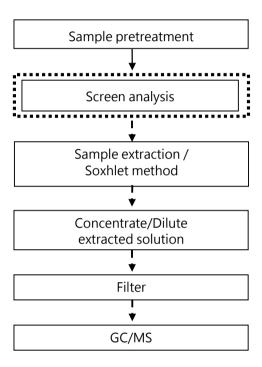


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Analytical flow chart - PBBs / PBDEs

First testing process ____ Optional screen process ____ Confirmation process ____

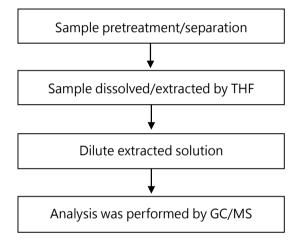




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Analytical flow chart - Phthalate

【Test method: IEC 62321-8】

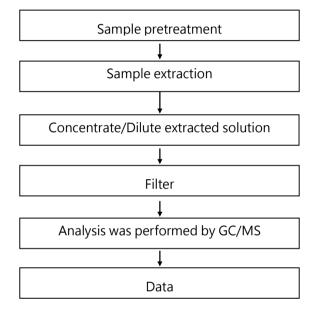




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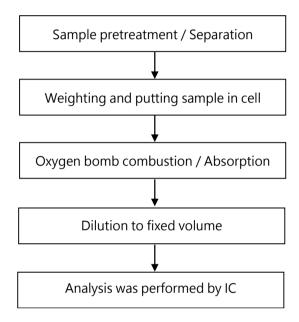
Analytical flow chart - HBCDD





o.: Date: 31-Oct-2023

Analytical flow chart - Halogen



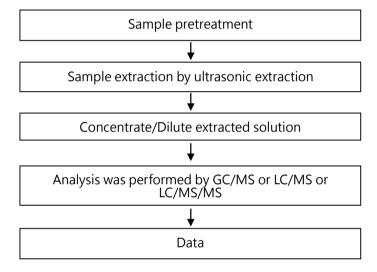
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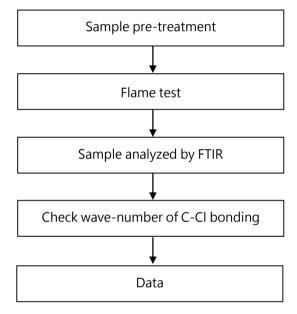
Analytical flow chart – PFAS (including PFOA/PFOS/its related compound, etc.)





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Analysis flow chart - PVC



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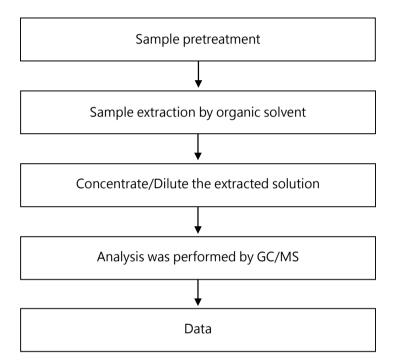
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Analytical flow chart

* Apply to: PCBs, PCNs, PCTs, Mirex, Chlorinated Paraffins, DBBT



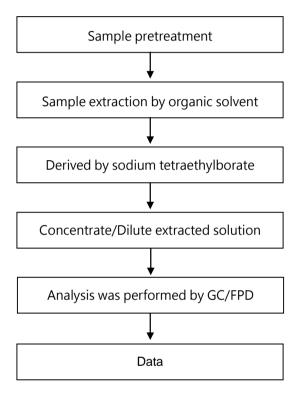
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Analytical flow chart - Organic-Tin



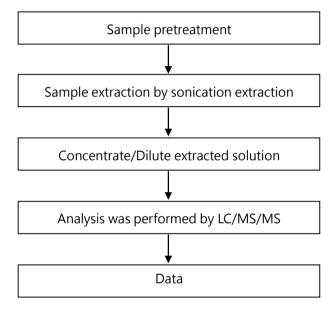
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Analytical flow chart - Bisphenol A



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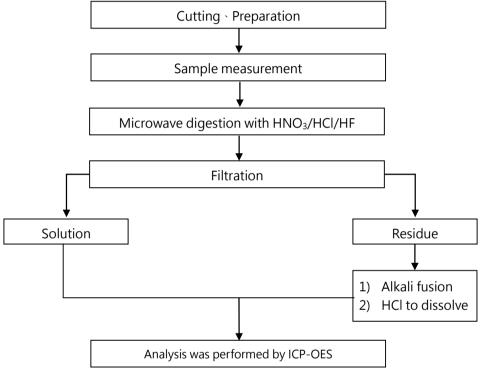
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Date: 31-Oct-2023

Analytical flow chart of elements (Heavy metal included)

These samples were dissolved totally by pre-conditioning method according to below flow chart. 【Reference method: US EPA 3051A、US EPA 3052】



* US EPA 3051A method does not add HF.

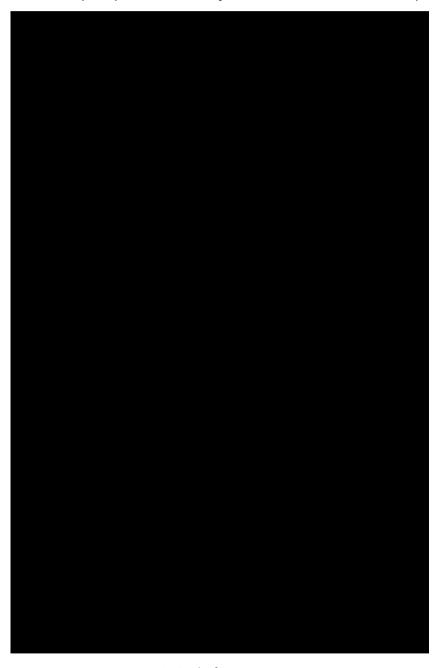
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* The tested sample / part is marked by an arrow if it's shown on the photo. *



** End of Report **

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TI Report Number: 64162367

Component: Lead Frame Plating

Analysis Type: RoHS 10 & Halogens

Analysis Date: 10/31/2023





The following sample(s) was/were submitted and identified by the applicant as:

Sample Submitted By

:

Sample Name

: Au PLATING

Sample Receiving Date

: 23-Oct-2023

Testing Period

: 23-Oct-2023 to 31-Oct-2023

Test Requested

(1) As specified by client, with reference to RoHS 2011/65/EU Annex II and amending Directive (EU) 2015/863 to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP contents in the submitted sample(s).

(2) Please refer to next pages for the other item(s).

Test Results

Please refer to following pages.

Conclusion

(1) Based on the performed tests on submitted sample(s), the test results of Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.







No.:

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Test Part Description

No.1 : GOLDEN COLORED METAL

Test Result(s)

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Cadmium (Cd)	With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.	mg/kg	2	n.d.	100
Lead (Pb)	With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.	mg/kg	2	n.d.	1000
Mercury (Hg)	With reference to IEC 62321-4: 2013+ AMD1: 2017, analysis was performed by ICP-OES.	mg/kg	2	n.d.	1000
Hexavalent Chromium Cr(VI) (#2)	With reference to IEC 62321-7-1: 2015, analysis was performed by UV-VIS.	μg/cm²	0.1	n.d.	-
Monobromobiphenyl		mg/kg	5	n.d.	-
Dibromobiphenyl		mg/kg	5	n.d.	=
Tribromobiphenyl		mg/kg	5	n.d.	-
Tetrabromobiphenyl		mg/kg	5	n.d.	-
Pentabromobiphenyl		mg/kg	5	n.d.	-
Hexabromobiphenyl		mg/kg	5	n.d.	=
Heptabromobiphenyl		mg/kg	5	n.d.	=
Octabromobiphenyl		mg/kg	5	n.d.	=
Nonabromobiphenyl		mg/kg	5	n.d.	=
Decabromobiphenyl		mg/kg	5	n.d.	-
Sum of PBBs	With reference to IEC 62321-6: 2015,	mg/kg	-	n.d.	1000
Monobromodiphenyl ether	analysis was performed by GC/MS.	mg/kg	5	n.d.	=
Dibromodiphenyl ether		mg/kg	5	n.d.	-
Tribromodiphenyl ether		mg/kg	5	n.d.	-
Tetrabromodiphenyl ether		mg/kg	5	n.d.	-
Pentabromodiphenyl ether		mg/kg	5	n.d.	-
Hexabromodiphenyl ether		mg/kg	5	n.d.	-
Heptabromodiphenyl ether		mg/kg	5	n.d.	-
Octabromodiphenyl ether		mg/kg	5	n.d.	-
Nonabromodiphenyl ether		mg/kg	5	n.d.	-
Decabromodiphenyl ether		mg/kg	5	n.d.	-
Sum of PBDEs		mg/kg	-	n.d.	1000



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Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Butyl benzyl phthalate (BBP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Dibutyl phthalate (DBP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Di-(2-ethylhexyl) phthalate (DEHP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Diisobutyl phthalate (DIBP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Diisodecyl phthalate (DIDP) (CAS No.: 26761-40-0, 68515-49-1)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Diisononyl phthalate (DINP) (CAS No.: 28553-12-0, 68515-48-0)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Di-n-octyl phthalate (DNOP) (CAS No.: 117-84-0)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Bis(2-methoxyethyl) phthalate (DMEP) (CAS No.: 117-82-8)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Di-n-pentyl phthalate (DNPP) (CAS No.: 131-18-0)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Di-n-hexyl phthalate (DNHP) (CAS No.: 84-75-3)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
1,2-Benzenedicarboxylic acid, di-C6- 8-branched alkyl esters, C7-rich (DIHP) (CAS No.: 71888-89-6)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
1,2-Benzenedicarboxylic acid, di-C7- 11-branched and linear alkyl esters (DHNUP) (CAS No.: 68515-42-4)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	
Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α - HBCDD, β - HBCDD, γ - HBCDD) (CAS No.: 25637-99-4, 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	With reference to IEC 62321-9: 2021, analysis was performed by GC/MS.	mg/kg	20	n.d.	-

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Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Fluorine (F) (CAS No.: 14762-94-8)	With reference to BS EN 14582: 2016,	mg/kg	50	n.d.	-
	analysis was performed by IC.				
Chlorine (Cl) (CAS No.: 22537-15-1)	With reference to BS EN 14582: 2016,	mg/kg	50	n.d.	-
	analysis was performed by IC.				
Bromine (Br) (CAS No.: 10097-32-2)	With reference to BS EN 14582: 2016,	mg/kg	50	n.d.	-
	analysis was performed by IC.				
lodine (I) (CAS No.: 14362-44-8)	With reference to BS EN 14582: 2016,	mg/kg	50	n.d.	-
	analysis was performed by IC.				
PFOS and its salts (CAS No.: 1763-	With reference to CEN/TS 15968: 2010,	mg/kg	0.01	n.d.	-
23-1 and its salts)	analysis was performed by LC/MS/MS.				
PFOA and its salts (CAS No.: 335-67-	With reference to CEN/TS 15968: 2010,	mg/kg	0.01	n.d.	=
1 and its salts)	analysis was performed by LC/MS/MS.				
Polyvinyl chloride (PVC)	With reference to ASTM E1252: 2021,	**	-	Negative	-
	analysis was performed by FT-IR and				
	Flame Test.				
Polychlorinated biphenyls (PCBs)	With reference to US EPA 3550C: 2007,	mg/kg	0.5	n.d.	-
	analysis was performed by GC/MS.				
Polychlorinated naphthalene (PCNs)	With reference to US EPA 3550C: 2007,	mg/kg	5	n.d.	-
	analysis was performed by GC/MS.				
Polychlorinated terphenyls (PCTs)	With reference to US EPA 3550C: 2007,	mg/kg	0.5	n.d.	-
	analysis was performed by GC/MS.				
Short Chain Chlorinated	With reference to ISO 18219-1: 2021,	mg/kg	50	n.d.	=
Paraffins(C10-C13) (SCCP) (CAS No.:	analysis was performed by GC/MS.				
85535-84-8)					
Tributyl tin (TBT)	With reference to ISO 17353: 2004,	mg/kg	0.03	n.d.	=
	analysis was performed by GC/FPD.				
Bis(tributyltin) oxide (TBTO) (CAS	Calculated from the result of Tributyl	mg/kg	0.03 ▲	n.d.	-
No.: 56-35-9)	Tin (TBT).				
Triphenyl tin (TPT)	With reference to ISO 17353: 2004,	mg/kg	0.03	n.d.	-
	analysis was performed by GC/FPD.				
Dibutyl tin (DBT)	With reference to ISO 17353: 2004,	mg/kg	0.03	n.d.	=
	analysis was performed by GC/FPD.				
Dioctyl tin (DOT)	With reference to ISO 17353: 2004,	mg/kg	0.03	n.d.	-
	analysis was performed by GC/FPD.				
Bisphenol A (CAS No.: 80-05-7)	With reference to RSTS-CHEM-239-1,	mg/kg	1	n.d.	-
	analysis was performed by LC/MS/MS.				

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Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Antimony (Sb) (CAS No.: 7440-36-0)	With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.	mg/kg	2	n.d.	-
Beryllium (Be) (CAS No.: 7440-41-7)	With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.	mg/kg	2	n.d.	-
Arsenic (As) (CAS No.: 7440-38-2)	With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.	mg/kg	2	n.d.	-

Note:

- 1. mg/kg = ppm; 0.1wt% = 0.1% = 1000ppm
- 2. MDL = Method Detection Limit
- 3. n.d. = Not Detected (Less than MDL)
- 4. "-" = Not Regulated
- 5. **= Qualitative analysis (No Unit)
- 6. Negative = Undetectable ; Positive = Detectable
- 7.(#2) =
 - a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 μ g/cm². The sample coating is considered to contain Cr(VI).
 - b. The sample is negative for Cr(VI) if Cr(VI) is n.d. (concentration less than 0.10 μ g/cm²). The coating is considered a non-Cr(VI) based coating
 - c. The result between 0.10 μ g/cm² and 0.13 μ g/cm² is considered to be inconclusive unavoidable coating variations may influence the determination.
- 8. ▲ : The MDL was evaluated for element / tested substance.

Conversion Formula : $AX = A \times F$

AX	Α	F
Bis(tributyltin)oxide (TBTO)	Tributyl Tin (TBT)	1.0276

Parameter Conversion Table: https://eecloud.sgs.com/Region_TW/DocDownload.aspx?name=Others

9. 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. According to this rule, the judgement of conformity is based on the comparing test results with limits.

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PFAS Remark:

The quantitative technology of PFAS is to analyze the specific structure of PFAS substances. However, PFAS acid and its salts with the same carbon number group have the same specific structure that can be identified. The tested results of the analyzed specific structure cannot be distinguished to identify the contribution from PFAS acid or its salts. Therefore, the tested results display the sum of concentrations of PFAS acids and its salts with the same carbon number group. The concentration of PFAS substances in the below table have been included in the tested results, please refer to the table for relevant information: (The listed PFAS substances are examples only, it do not include all PFAS salts with the same carbon number group.)

Classification of Substance Concentration	Substance Name	CAS No.
Perfluorooctane sulfonates and	Potassium perfluorooctanesulfonate (PFOS-K)	2795-39-3
its salts (PFOS and its salts)	Perfluorooctanesulfonic acid, lithium salt (PFOS-Li)	29457-72-5
(CAS No.: 1763-23-1 and its salts)	Perfluorooctanesulfonic acid, ammonium salt (PFOS-NH ₄)	29081-56-9
	Perfluorooctane sulfonate diethanolamine salt (PFOS-NH(OH) ₂)	70225-14-8
	Perfluorooctanesulfonic acid, tetraethylammonium salt (PFOS-N(C_2H_5) ₄)	56773-42-3
	N-decyl-N,N-dimethyldecan-1-aminium 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluorooctane- 1-sulfonate (PFOS-DDA)	251099-16-8
	Perfluorooctane sulfonyl fluoride (POSF)	307-35-7
Perfluorooctane sulfonates and its salts (PFOS and its salts)	Perfluorooctanesulfonic acid, magnesium salt (PFOS-Mg)	91036-71-4
(CAS No.: 1763-23-1 and its salts)	Perfluorooctanesulfonic acid, sodium salt (PFOS-Na)	4021-47-0
Perfluorooctanoic acid and its	Sodium perfluorooctanoate (PFOA-Na)	335-95-5
salts (PFOA and its salts)	Potassium perfluorooctanoate (PFOA-K)	2395-00-8
(CAS No.: 335-67-1 and its salts)	Silver perfluorooctanote (PFOA-Ag)	335-93-3
	Perfluorooctanoyl fluoride (PFOA-F)	335-66-0
	Ammonium pentadecafluorooctanoate (APFO)	3825-26-1
	Lithium perfluorooctanoate (PFOA-Li)	17125-58-5

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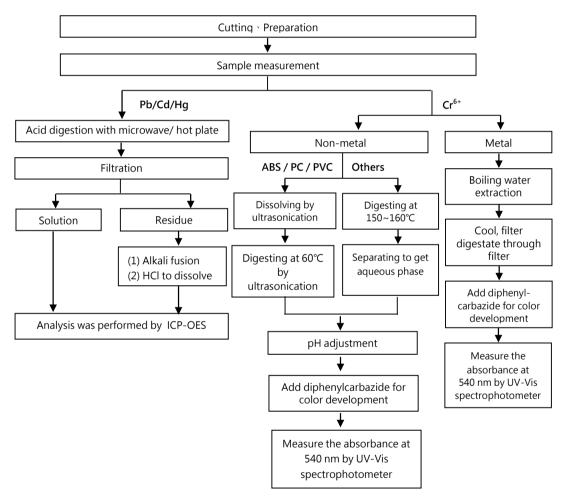


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Analytical flow chart of heavy metal

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

(Cr⁶⁺ test method excluded)



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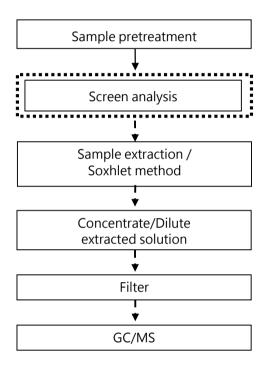


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Analytical flow chart - PBBs / PBDEs

First testing process _____
Optional screen process....
Confirmation process __._

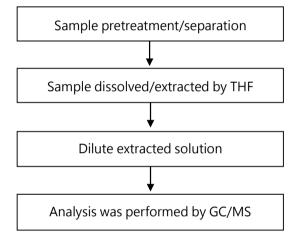




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Analytical flow chart - Phthalate

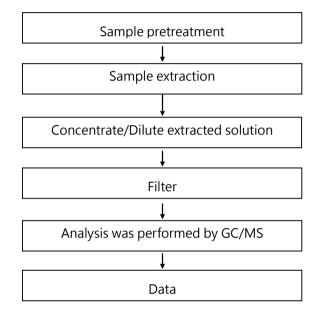
【Test method: IEC 62321-8】





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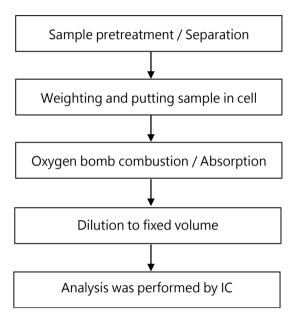
Analytical flow chart - HBCDD





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Analytical flow chart - Halogen



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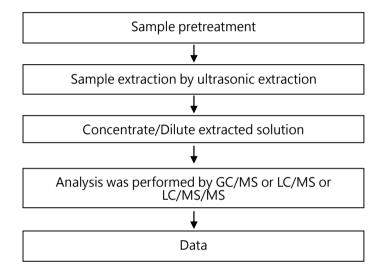
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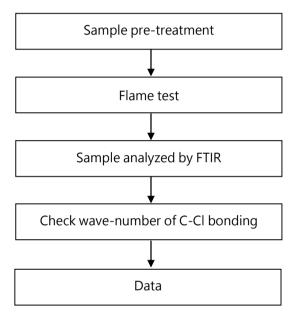
Analytical flow chart – PFAS (including PFOA/PFOS/its related compound, etc.)





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Analysis flow chart - PVC



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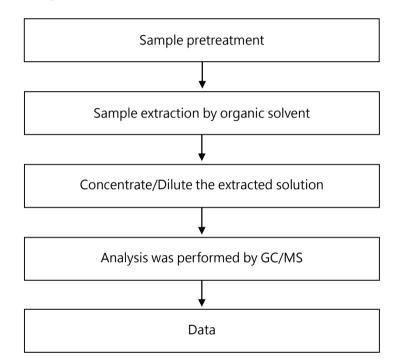
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Analytical flow chart

* Apply to: PCBs, PCNs, PCTs, Mirex, Chlorinated Paraffins, DBBT



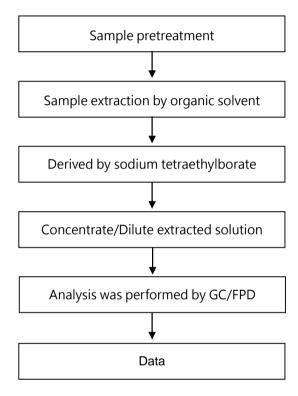
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Analytical flow chart - Organic-Tin



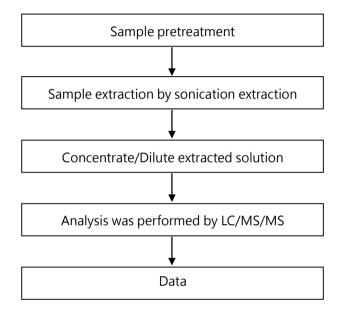
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Analytical flow chart - Bisphenol A



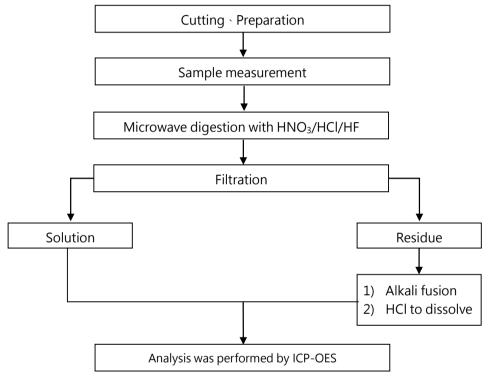


Date: 31-Oct-2023

Analytical flow chart of elements (Heavy metal included)

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

【Reference method: US EPA 3051A \ US EPA 3052】



* US EPA 3051A method does not add HF.

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* The tested sample / part is marked by an arrow if it's shown on the photo. *



** End of Report **



TI Report Number: 64162369

Component: Lead Frame Plating

Analysis Type: RoHS 10 & Halogens

Analysis Date: 10/31/2023





The following sample(s) was/were submitted and identified by the applicant as:

Sample Submitted By

:

Sample Name

Pd PLATING

Sample Receiving Date

: 23-Oct-2023

Testing Period

: 23-Oct-2023 to 31-Oct-2023

Test Requested

(1) As specified by client, with reference to RoHS 2011/65/EU Annex II and amending Directive (EU) 2015/863 to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP contents in the submitted sample(s).

(2) Please refer to next pages for the other item(s).

Test Results

Please refer to following pages.

Conclusion

(1) Based on the performed tests on submitted sample(s), the test results of Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.







.: Date: 31-Oct-2023

Test Part Description

No.1 : SILVER COLORED METAL

Test Result(s)

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	•
Cadmium (Cd)	With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.	mg/kg	2	n.d.	100
Lead (Pb)	With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.	mg/kg	2	n.d.	1000
Mercury (Hg)	With reference to IEC 62321-4: 2013+ AMD1: 2017, analysis was performed by ICP-OES.	mg/kg	2	n.d.	1000
Hexavalent Chromium Cr(VI) (#2)	With reference to IEC 62321-7-1: 2015, analysis was performed by UV-VIS.	μg/cm²	0.1	n.d.	-
Monobromobiphenyl		mg/kg	5	n.d.	-
Dibromobiphenyl		mg/kg	5	n.d.	-
Tribromobiphenyl		mg/kg	5	n.d.	-
Tetrabromobiphenyl		mg/kg	5	n.d.	-
Pentabromobiphenyl		mg/kg	5	n.d.	-
Hexabromobiphenyl		mg/kg	5	n.d.	-
Heptabromobiphenyl		mg/kg	5	n.d.	-
Octabromobiphenyl		mg/kg	5	n.d.	-
Nonabromobiphenyl		mg/kg	5	n.d.	-
Decabromobiphenyl		mg/kg	5	n.d.	-
Sum of PBBs	With reference to IEC 62321-6: 2015,	mg/kg	-	n.d.	1000
Monobromodiphenyl ether	analysis was performed by GC/MS.	mg/kg	5	n.d.	-
Dibromodiphenyl ether		mg/kg	5	n.d.	-
Tribromodiphenyl ether		mg/kg	5	n.d.	-
Tetrabromodiphenyl ether		mg/kg	5	n.d.	-
Pentabromodiphenyl ether		mg/kg	5	n.d.	-
Hexabromodiphenyl ether		mg/kg	5	n.d.	-
Heptabromodiphenyl ether		mg/kg	5	n.d.	-
Octabromodiphenyl ether		mg/kg	5	n.d.	-
Nonabromodiphenyl ether		mg/kg	5	n.d.	-
Decabromodiphenyl ether		mg/kg	5	n.d.	-
Sum of PBDEs		mg/kg	-	n.d.	1000

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Date: 31-Oct-2023

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Butyl benzyl phthalate (BBP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Dibutyl phthalate (DBP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Di-(2-ethylhexyl) phthalate (DEHP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Diisobutyl phthalate (DIBP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Diisodecyl phthalate (DIDP) (CAS No.: 26761-40-0, 68515-49-1)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Diisononyl phthalate (DINP) (CAS No.: 28553-12-0, 68515-48-0)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Di-n-octyl phthalate (DNOP) (CAS No.: 117-84-0)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Bis(2-methoxyethyl) phthalate (DMEP) (CAS No.: 117-82-8)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Di-n-pentyl phthalate (DNPP) (CAS No.: 131-18-0)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Di-n-hexyl phthalate (DNHP) (CAS No.: 84-75-3)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
1,2-Benzenedicarboxylic acid, di-C6- 8-branched alkyl esters, C7-rich (DIHP) (CAS No.: 71888-89-6)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
1,2-Benzenedicarboxylic acid, di-C7- 11-branched and linear alkyl esters (DHNUP) (CAS No.: 68515-42-4)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	
Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α - HBCDD, β - HBCDD, γ - HBCDD) (CAS No.: 25637-99-4, 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	With reference to IEC 62321-9: 2021, analysis was performed by GC/MS.	mg/kg	20	n.d.	-

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Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Fluorine (F) (CAS No.: 14762-94-8)	With reference to BS EN 14582: 2016,	mg/kg	50	n.d.	=
	analysis was performed by IC.				
Chlorine (Cl) (CAS No.: 22537-15-1)	With reference to BS EN 14582: 2016,	mg/kg	50	n.d.	-
	analysis was performed by IC.				
Bromine (Br) (CAS No.: 10097-32-2)	With reference to BS EN 14582: 2016,	mg/kg	50	n.d.	-
	analysis was performed by IC.				
lodine (I) (CAS No.: 14362-44-8)	With reference to BS EN 14582: 2016,	mg/kg	50	n.d.	-
	analysis was performed by IC.				
PFOS and its salts (CAS No.: 1763-	With reference to CEN/TS 15968: 2010,	mg/kg	0.01	n.d.	-
23-1 and its salts)	analysis was performed by LC/MS/MS.				
PFOA and its salts (CAS No.: 335-67-	With reference to CEN/TS 15968: 2010,	mg/kg	0.01	n.d.	=
1 and its salts)	analysis was performed by LC/MS/MS.				
Polyvinyl chloride (PVC)	With reference to ASTM E1252: 2021,	**	-	Negative	-
	analysis was performed by FT-IR and				
	Flame Test.				
Polychlorinated biphenyls (PCBs)	With reference to US EPA 3550C: 2007,	mg/kg	0.5	n.d.	-
	analysis was performed by GC/MS.				
Polychlorinated naphthalene (PCNs)	With reference to US EPA 3550C: 2007,	mg/kg	5	n.d.	-
	analysis was performed by GC/MS.				
Polychlorinated terphenyls (PCTs)	With reference to US EPA 3550C: 2007,	mg/kg	0.5	n.d.	-
	analysis was performed by GC/MS.				
Short Chain Chlorinated	With reference to ISO 18219-1: 2021,	mg/kg	50	n.d.	=
Paraffins(C10-C13) (SCCP) (CAS No.:	analysis was performed by GC/MS.				
85535-84-8)					
Tributyl tin (TBT)	With reference to ISO 17353: 2004,	mg/kg	0.03	n.d.	=
	analysis was performed by GC/FPD.				
Bis(tributyltin) oxide (TBTO) (CAS	Calculated from the result of Tributyl	mg/kg	0.03 ▲	n.d.	-
No.: 56-35-9)	Tin (TBT).				
Triphenyl tin (TPT)	With reference to ISO 17353: 2004,	mg/kg	0.03	n.d.	-
	analysis was performed by GC/FPD.				
Dibutyl tin (DBT)	With reference to ISO 17353: 2004,	mg/kg	0.03	n.d.	=
	analysis was performed by GC/FPD.				
Dioctyl tin (DOT)	With reference to ISO 17353: 2004,	mg/kg	0.03	n.d.	-
	analysis was performed by GC/FPD.				
Bisphenol A (CAS No.: 80-05-7)	With reference to RSTS-CHEM-239-1,	mg/kg	1	n.d.	-
	analysis was performed by LC/MS/MS.				

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Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Antimony (Sb) (CAS No.: 7440-36-0)	With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.	mg/kg	2	n.d.	-
Beryllium (Be) (CAS No.: 7440-41-7)	With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.	mg/kg	2	n.d.	-
Arsenic (As) (CAS No.: 7440-38-2)	With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.	mg/kg	2	n.d.	-

Note:

- 1. mg/kg = ppm; 0.1wt% = 0.1% = 1000ppm
- 2. MDL = Method Detection Limit
- 3. n.d. = Not Detected (Less than MDL)
- 4. "-" = Not Regulated
- 5. **= Qualitative analysis (No Unit)
- 6. Negative = Undetectable ; Positive = Detectable
- 7.(#2) =
 - a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 μ g/cm². The sample coating is considered to contain Cr(VI).
 - b. The sample is negative for Cr(VI) if Cr(VI) is n.d. (concentration less than 0.10 μ g/cm²). The coating is considered a non-Cr(VI) based coating
 - c. The result between 0.10 μ g/cm² and 0.13 μ g/cm² is considered to be inconclusive unavoidable coating variations may influence the determination.
- 8. ▲ : The MDL was evaluated for element / tested substance.

Conversion Formula : $AX = A \times F$

AX	Α	F
Bis(tributyltin)oxide (TBTO)	Tributyl Tin (TBT)	1.0276

Parameter Conversion Table: https://eecloud.sgs.com/Region_TW/DocDownload.aspx?name=Others

9. 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. According to this rule, the judgement of conformity is based on the comparing test results with limits.

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PFAS Remark:

The quantitative technology of PFAS is to analyze the specific structure of PFAS substances. However, PFAS acid and its salts with the same carbon number group have the same specific structure that can be identified. The tested results of the analyzed specific structure cannot be distinguished to identify the contribution from PFAS acid or its salts. Therefore, the tested results display the sum of concentrations of PFAS acids and its salts with the same carbon number group. The concentration of PFAS substances in the below table have been included in the tested results, please refer to the table for relevant information: (The listed PFAS substances are examples only, it do not include all PFAS salts with the same carbon number group.)

Classification of Substance Concentration	Substance Name	CAS No.
Perfluorooctane sulfonates and	Potassium perfluorooctanesulfonate (PFOS-K)	2795-39-3
its salts (PFOS and its salts)	Perfluorooctanesulfonic acid, lithium salt (PFOS-Li)	29457-72-5
(CAS No.: 1763-23-1 and its salts)	Perfluorooctanesulfonic acid, ammonium salt (PFOS-NH ₄)	29081-56-9
	Perfluorooctane sulfonate diethanolamine salt (PFOS-NH(OH) ₂)	70225-14-8
	Perfluorooctanesulfonic acid, tetraethylammonium salt (PFOS-N(C_2H_5) ₄)	56773-42-3
	N-decyl-N,N-dimethyldecan-1-aminium 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluorooctane- 1-sulfonate (PFOS-DDA)	251099-16-8
	Perfluorooctane sulfonyl fluoride (POSF)	307-35-7
Perfluorooctane sulfonates and its salts (PFOS and its salts)	Perfluorooctanesulfonic acid, magnesium salt (PFOS-Mg)	91036-71-4
(CAS No.: 1763-23-1 and its salts)	Perfluorooctanesulfonic acid, sodium salt (PFOS-Na)	4021-47-0
Perfluorooctanoic acid and its	Sodium perfluorooctanoate (PFOA-Na)	335-95-5
salts (PFOA and its salts)	Potassium perfluorooctanoate (PFOA-K)	2395-00-8
(CAS No.: 335-67-1 and its salts)	Silver perfluorooctanote (PFOA-Ag)	335-93-3
	Perfluorooctanoyl fluoride (PFOA-F)	335-66-0
	Ammonium pentadecafluorooctanoate (APFO)	3825-26-1
	Lithium perfluorooctanoate (PFOA-Li)	17125-58-5

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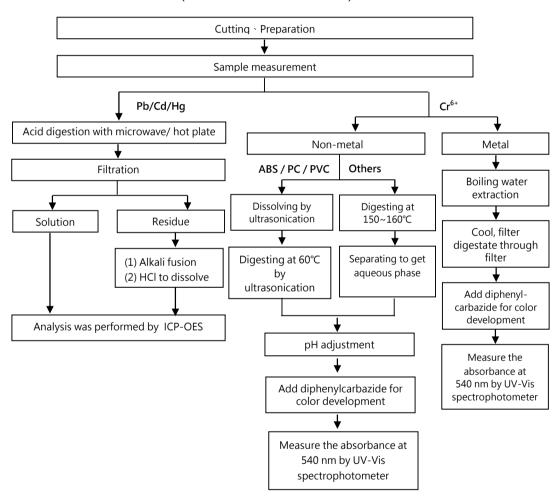
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Analytical flow chart of heavy metal

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

(Cr⁶⁺ test method excluded)



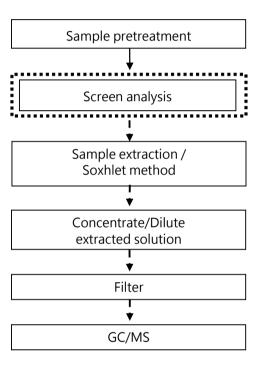


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Analytical flow chart - PBBs / PBDEs

First testing process _____
Optional screen process....
Confirmation process ____

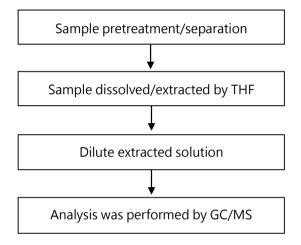




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Analytical flow chart - Phthalate

[Test method: IEC 62321-8]

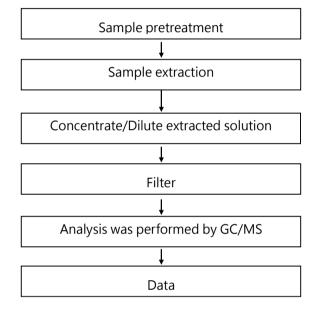




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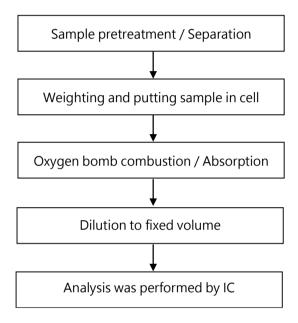
Analytical flow chart - HBCDD





Date: 31-Oct-2023

Analytical flow chart - Halogen



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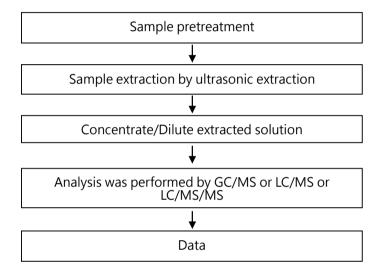
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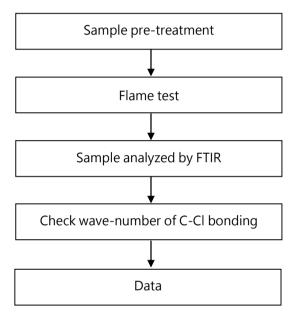
Analytical flow chart - PFAS (including PFOA/PFOS/its related compound, etc.)





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Analysis flow chart - PVC



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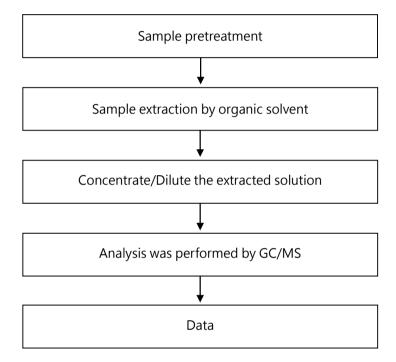
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Analytical flow chart

* Apply to: PCBs, PCNs, PCTs, Mirex, Chlorinated Paraffins, DBBT



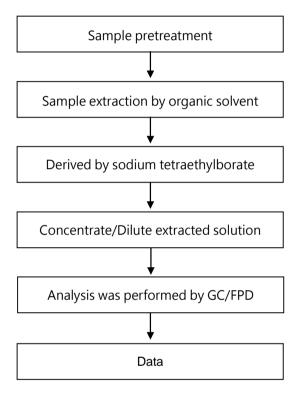
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Analytical flow chart - Organic-Tin



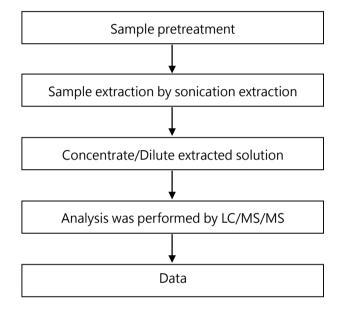
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Analytical flow chart - Bisphenol A



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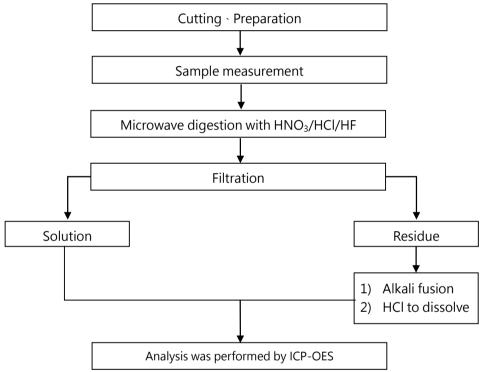


Date: 31-Oct-2023

Analytical flow chart of elements (Heavy metal included)

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

【Reference method: US EPA 3051A · US EPA 3052】



* US EPA 3051A method does not add HF.

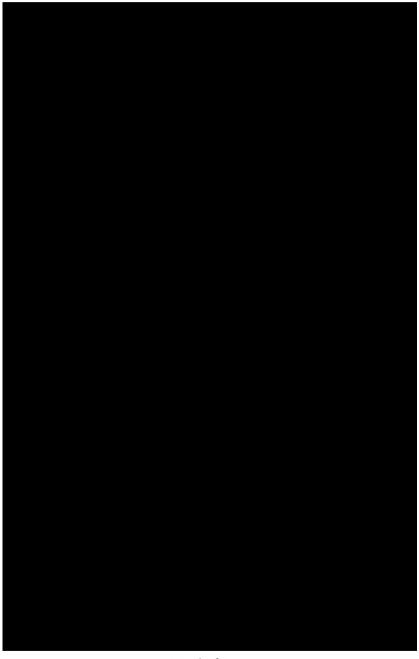
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o.: Date: 31-Oct-2023

* The tested sample / part is marked by an arrow if it's shown on the photo. *



** End of Report **

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TI Report Number: 64073999

Component : Mold Compound

Analysis Type: RoHS 10 & Halogens

Analysis Date: 10/11/2023



Date: 12-Oct-2023 Page: 1 of 13

The following sample(s) was/were submitted and identified by the applicant as:

Sample Submitted By

:

Sample Name

EPOXY MOLDING COMPOUND

Style/Item No.

:

Sample Receiving Date

04-Oct-2023

Testing Period

04-Oct-2023 to 12-Oct-2023

Test Requested

- (1) As specified by client, with reference to RoHS 2011/65/EU Annex II and amending Directive (EU) 2015/863 to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP contents in the submitted sample(s).
 - 2) Please refer to next pages for the other item(s).

Test Results

Please refer to following pages.

Conclusion

(1) Based on the performed tests on submitted sample(s), the test results of Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

Ray Chang, Ph.D./Departine Manage Signed for and on behalf SGS TAIWAN LTD. Chemical Laboratory-Kaohsiung





Date: 12-Oct-2023 Page: 2 of 13

TEST PART DESCRIPTION

No.1 : BLACK EPOXY MOLDING COMPOUND

Test Result(s)

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Cadmium (Cd)	With reference to IEC 62321-5: 2013,	mg/kg	2	n.d.	100
	analysis was performed by ICP-OES.				
Lead (Pb)	With reference to IEC 62321-5: 2013,	mg/kg	2	n.d.	1000
	analysis was performed by ICP-OES.				
Mercury (Hg)	With reference to IEC 62321-4: 2013+	mg/kg	2	n.d.	1000
	AMD1: 2017, analysis was performed				
	by ICP-OES.				
Hexavalent Chromium Cr(VI)	With reference to IEC 62321-7-2: 2017,	mg/kg	8	n.d.	1000
	analysis was performed by UV-VIS.				
Monobromobiphenyl		mg/kg	5	n.d.	-
Dibromobiphenyl		mg/kg	5	n.d.	-
Tribromobiphenyl		mg/kg	5	n.d.	-
Tetrabromobiphenyl		mg/kg	5	n.d.	-
Pentabromobiphenyl	With reference to IEC 62321-6: 2015,	mg/kg	5	n.d.	-
Hexabromobiphenyl	analysis was performed by GC/MS.	mg/kg	5	n.d.	-
Heptabromobiphenyl	unarysis was performed by defivis.	mg/kg	5	n.d.	-
Octabromobiphenyl		mg/kg	5	n.d.	-
Nonabromobiphenyl		mg/kg	5	n.d.	-
Decabromobiphenyl		mg/kg	5	n.d.	-
Sum of PBBs		mg/kg	-	n.d.	1000
Monobromodiphenyl ether		mg/kg	5	n.d.	-
Dibromodiphenyl ether		mg/kg	5	n.d.	-
Tribromodiphenyl ether		mg/kg	5	n.d.	ı
Tetrabromodiphenyl ether		mg/kg	5	n.d.	ı
Pentabromodiphenyl ether	With reference to IEC 62321-6: 2015,	mg/kg	5	n.d.	-
Hexabromodiphenyl ether	analysis was performed by GC/MS.	mg/kg	5	n.d.	1
Heptabromodiphenyl ether	analysis was performed by GC/Wis.	mg/kg	5	n.d.	1
Octabromodiphenyl ether		mg/kg	5	n.d.	-
Nonabromodiphenyl ether		mg/kg	5	n.d.	1
Decabromodiphenyl ether		mg/kg	5	n.d.	-
Sum of PBDEs		mg/kg	-	n.d.	1000



Page: 3 of 13 Date: 12-Oct-2023

Test Item(s)	Method	Unit	MDL	Result	Limit
Dandlium (Da) (CAC No : 7440, 41, 7)	With reference to UC FDA 2052: 1006	20 G /l/G	2	No.1	
Beryllium (Be) (CAS No.: 7440-41-7)	With reference to US EPA 3052: 1996,	mg/kg	2	n.d.	-
A (A) (CACAL 7440 20 2)	analysis was performed by ICP-OES.				
Arsenic (As) (CAS No.: 7440-38-2)	With reference to US EPA 3052: 1996,	mg/kg	2	n.d.	-
(51) (616) 1 7440 26 2)	analysis was performed by ICP-OES.		•		
Antimony (Sb) (CAS No.: 7440-36-0)	With reference to US EPA 3052: 1996,	mg/kg	2	n.d.	-
	analysis was performed by ICP-OES.				
Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α -HBCDD, β - HBCDD, γ - HBCDD) (CAS No.: 25637-99-4, 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	With reference to IEC 62321: 2008, analysis was performed by GC/MS.	mg/kg	5	n.d.	-
Perfluorooctanoic acid (PFOA) and it's salt (CAS No.: 335-67-1 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
PFOS and its salts (CAS No.: 1763-23-1 and its salts)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Fluorine (F) (CAS No.: 14762-94-8)		mg/kg	50	n.d.	-
Chlorine (Cl) (CAS No.: 22537-15-1)	With reference to BS EN 14582: 2016,	mg/kg	50	n.d.	-
Bromine (Br) (CAS No.: 10097-32-2)	analysis was performed by IC.	mg/kg	50	n.d.	-
lodine (I) (CAS No.: 14362-44-8)		mg/kg	50	n.d.	-
Dibutyl phthalate (DBP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Di-(2-ethylhexyl) phthalate (DEHP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Diisobutyl phthalate (DIBP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Butyl benzyl phthalate (BBP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Diisopentyl phthalate (DIPP) (CAS No.: 605-50-5)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Diisononyl phthalate (DINP) (CAS No.: 28553-12-0, 68515-48-0)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Di-n-octyl phthalate (DNOP) (CAS No.: 117-84-0)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-



Page: 4 of 13 Date: 12-Oct-2023

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Di-n-hexyl phthalate (DNHP) (CAS No.:	With reference to IEC 62321-8: 2017,	mg/kg	50	n.d.	-
84-75-3)	analysis was performed by GC/MS.				
Bis(2-methoxyethyl) phthalate (DMEP)	With reference to IEC 62321-8: 2017,	mg/kg	50	n.d.	-
(CAS No.: 117-82-8)	analysis was performed by GC/MS.				
Di-pentyl phthalate (DPP) (CAS No.:	With reference to IEC 62321-8: 2017,	mg/kg	50	n.d.	-
131-18-0)	analysis was performed by GC/MS.				
1,2-Benzenedicarboxylic acid, di-C6-8-	With reference to IEC 62321-8: 2017,	mg/kg	50	n.d.	-
branched alkyl esters, C7-rich (DIHP)	analysis was performed by GC/MS.				
(CAS No.: 71888-89-6)					
1,2-Benzenedicarboxylic acid, di-C7-	With reference to IEC 62321-8: 2017,	mg/kg	50	n.d.	-
11-branched and linear alkyl esters	analysis was performed by GC/MS.				
(DHNUP) (CAS No.: 68515-42-4)					
Diisodecyl phthalate (DIDP) (CAS No.:	With reference to IEC 62321-8: 2017,	mg/kg	50	n.d.	-
26761-40-0, 68515-49-1)	analysis was performed by GC/MS.				

Note:

- 1. mg/kg = ppm; 0.1wt% = 0.1% = 1000ppm
- 2. MDL = Method Detection Limit
- 3. n.d. = Not Detected (Less than MDL)
- 4. "-" = Not Regulated
- 5. 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. According to this rule, the judgement of conformity is based on the comparing test results with limits.
- 6. This is the additional test report of EKR23A00247.



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PFAS Remark:

The quantitative technology of PFAS is to analyze the specific structure of PFAS substances. However, PFAS acid and its salts with the same carbon number group have the same specific structure that can be identified. The tested results of the analyzed specific structure cannot be distinguished to identify the contribution from PFAS acid or its salts. Therefore, the tested results display the sum of concentrations of PFAS acids and its salts with the same carbon number group. The concentration of PFAS substances in the below table have been included in the tested results, please refer to the table for relevant information: (The listed PFAS substances are examples only, it do not include all PFAS salts with the same carbon number group.)

Classification of Substance Concentration	Substance Name	CAS No.
Perfluorooctane sulfonates and its	Potassium perfluorooctanesulfonate (PFOS-K)	2795-39-3
salts (PFOS and its salts)	Perfluorooctanesulfonic acid, lithium salt (PFOS-Li)	29457-72-5
(CAS No.: 1763-23-1 and its salts)	Perfluorooctanesulfonic acid, ammonium salt (PFOS-NH ₄)	29081-56-9
	Perfluorooctane sulfonate diethanolamine salt (PFOS-NH(OH) ₂)	70225-14-8
	Perfluorooctanesulfonic acid, tetraethylammonium salt (PFOS-N(C_2H_5) ₄)	56773-42-3
	N-decyl-N,N-dimethyldecan-1-aminium 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluorooctane- 1-sulfonate (PFOS-DDA)	251099-16-8
	Perfluorooctane sulfonyl fluoride (POSF)	307-35-7
	Perfluorooctanesulfonic acid, magnesium salt (PFOS-Mg)	91036-71-4
	Perfluorooctanesulfonic acid, sodium salt (PFOS-Na)	4021-47-0
Perfluorooctanoic acid and its salts	Sodium perfluorooctanoate (PFOA-Na)	335-95-5
(PFOA and its salts)	Potassium perfluorooctanoate (PFOA-K)	2395-00-8
(CAS No.: 335-67-1 and its salts)	Silver perfluorooctanote (PFOA-Ag)	335-93-3
	Perfluorooctanoyl fluoride (PFOA-F)	335-66-0
	Ammonium pentadecafluorooctanoate (APFO)	3825-26-1
	Lithium perfluorooctanoate (PFOA-Li)	17125-58-5

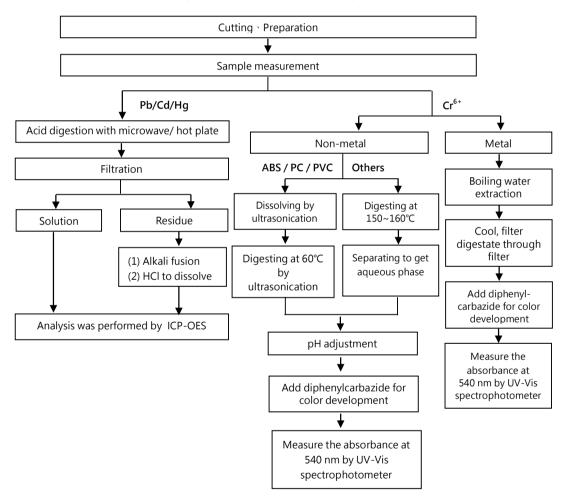


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Analytical flow chart of heavy metal

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

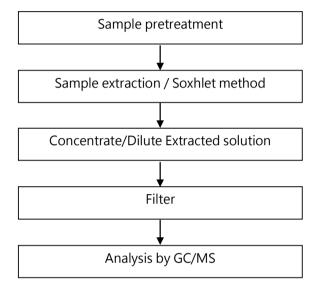
(Cr⁶⁺ test method excluded)





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PBB/PBDE analytical FLOW CHART



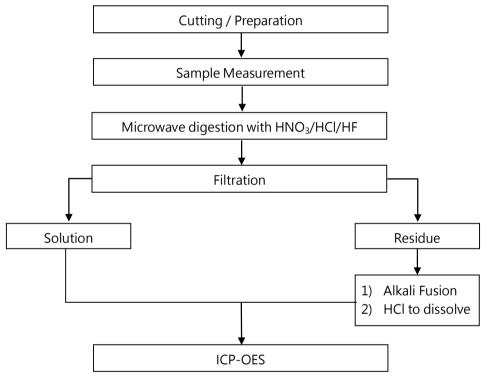


Date: 12-Oct-2023 Page: 8 of 13

Analytical flow chart of Elements (Heavy Metal included)

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

【Reference method: US EPA 3051A \ US EPA 3052】

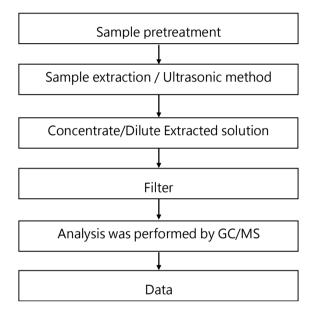


* US EPA 3051A method does not add HF.



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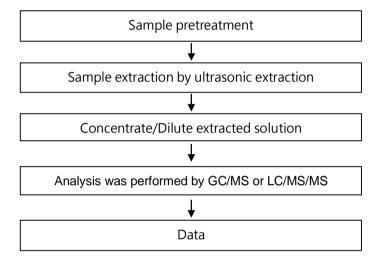
Analytical flow chart - HBCDD





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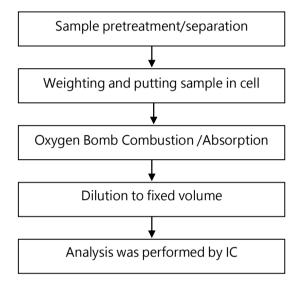
Analytical flow chart - PFAS (including PFOA/PFOS/its related compound, etc.)





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Analytical flow chart of Halogen

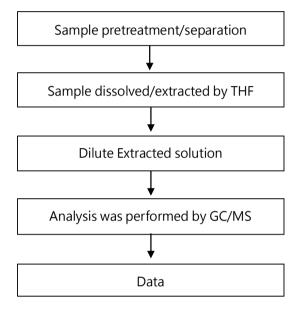




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Analytical flow chart of phthalate content

【Test method: IEC 62321-8】





Date: 12-Oct-2023 Page: 13 of 13

* The tested sample / part is marked by an arrow if it's shown on the photo. *



** End of Report **



TI Report Number: 62016102

Component : Bond Wire

Analysis Type: RoHS 10 & Halogens

Analysis Date: 08/25/2023



TEST REPORT:

No.	
Job Ref.	

REPORTED DATE: 25-August-2023

The following sample(s) was/were submitted and identified by applicant as:

SAMPLE DESCRIPTION : Au BONDING WIRE

SAMPLE RECEIVED : 09-August-2023

TESTING PERIOD : 09-August-2023 to 25-August-2023

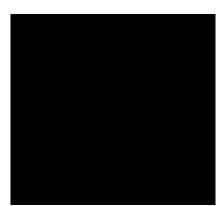
TEST REQUESTED : Selected test(s) as requested by customer

TEST METHOD : -PLEASE REFER TO NEXT PAGE(S)TEST RESULTS : -PLEASE REFER TO NEXT PAGE(S)-

SIGNED FOR AND ON BEHALF OF SGS (MALAYSIA) SDN BHD

TAY SIAM PINE
TECHNICAL MANAGER
IKM No. M/3452/6047/11/12

Test Report Form No.: SGS/TR/CP/013, Ver: 6.0, Effective Date: 07/07/2021





Job Ref.

TEST RESULTS:
Test Part Description

Sample Description: -PLEASE REFER TO PAGE 1-

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

Test Parameter(s):	Unit	Test Method	Result	MDL	Limit
Lead (Pb)	mg/kg	With reference to IEC 62321-5:2013, determination of Lead by ICP-OES.	N.D.	2	Max 1000
Cadmium (Cd)	mg/kg	With reference to IEC 62321-5:2013, determination of Cadmium by ICP-OES.	N.D.	2	Max 100
Mercury (Hg)	mg/kg	With reference to IEC 62321-4:2013+A1:2017, determination of Mercury by ICP-OES.	N.D.	2	Max 1000
Hexavalent Chromium (CrVI)	µg/cm²	With reference to IEC 62321-7-1:2015, determination of Hexavalent Chromium by Colorimetric Method using UV-Vis.	N.D.	0.10	-
Hexavalent Chromium (CrVI)	mg/kg	With reference to JIS H 8625, determination of Hexavalent Chromium by Colorimetric Method using UV-Vis.	N.D.	2	Max 1000
Sum of PBBs	mg/kg	With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS.	N.D.	5	Max 1000
Monobromobiphenyl	mg/kg	With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS.	N.D.	5	-
Dibromobiphenyl	mg/kg	With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS.	N.D.	5	-
Tribromobiphenyl	mg/kg	With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS.	N.D.	5	-
Tetrabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS.	N.D.	5	-
Pentabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS.	N.D.	5	-
Hexabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS.	N.D.	5	-
Heptabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS.	N.D.	5	-
Octabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS.	N.D.	5	-
Nonabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS.	N.D.	5	-
Decabromobiphenyl	mg/kg	With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS.	N.D.	5	-

SIGNED FOR AND ON BEHALF OF SGS (MALAYSIA) SDN BHD

TAY SIAM PINE
TECHNICAL MANAGER

★
IKM No. M/3452/6047/11/12

Test Report Form No.: SGS/TR/CP/013, Ver. 6.0, Effective Date: 07/07/2021

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Job Ref.

TEST RESULTS:

Test Part Description

Sample Description: -PLEASE REFER TO PAGE 1-

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

Test Parameter(s):	Unit	Test Method	Result	MDL	Limit
Sum of PBDEs	mg/kg	With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS.	N.D.	5	Max 1000
Monobromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS.	N.D.	5	-
Dibromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS.	N.D.	5	-
Tribromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS.	N.D.	5	-
Tetrabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS.	N.D.	5	-
Pentabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS.	N.D.	5	-
Hexabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS.	N.D.	5	-
Heptabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS.	N.D.	5	-
Octabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS.	N.D.	5	-
Nonabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS.	N.D.	5	-
Decabromodiphenyl ether	mg/kg	With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS.	N.D.	5	-

Note: (a) mg/kg = ppm; ug/kg = ppb (0.01 mg/kg = 10 ug/kg); 0.1wt% = 1000ppm

- (b) N.D. = Not Detected
- (c) MDL = Method Detection Limit
- (d) = Not regulated
- (e) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.
- (f) a. The sample is positive for CrVI if the CrVI concentration is greater than 0.13 μg/cm². The sample coating is considered to contain CrVI.
 - b. The sample is negative for CrVI if CrVI is N.D. (concentration less than 0.10 $\mu g/cm^2$). The coating is considered a non-CrVI based coating.
 - c. The result between 0.10 μ g/cm² and 0. $\bar{1}3$ μ g/cm² is considered to be inconclusive unavoidable coating variations may influence the determination.

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

SIGNED FOR AND ON BEHALF OF SGS (MALAYSIA) SDN BHD

TAY SIAM PINE
TECHNICAL MANAGER

IKM No. M/3452/6047/11/12

Test Report Form No.: SGS/TR/CP/013, Ver. 6.0, Effective Date: 07/07/2021

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Job Ref.

TEST RESULTS:

Test Part Description

Sample Description: -PLEASE REFER TO PAGE 1-

Optional: RoHS Directive 2011/65/EU, priority substances

Test Parameter(s):	Unit	Test Method	Result	MDL
Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α-HBCDD, β-HBCDD, γ-HBCDD) (CAS No.: 25637-99-4, 3194-55-6(134237-51-7, 134237-50-6, 134237-52-8))	mg/kg	In-house method, SGS-TM-RSTS-O-012, with reference to IEC 62321-6:2015. Analysis was performed by GCMS	N.D.	5

Note: (a) Reference Information: Directive 2011/65/EU recasting RoHS directive 2002/95/EC: Hexabromocyclododecane (HBCDD), Bis (2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) are considered as a priority for risk evaluation and substance restriction.

(b) N.D. = Not Detected

SIGNED FOR AND ON BEHALF OF SGS (MALAYSIA) SDN BHD

TAY SIAM PINE
TECHNICAL MANAGER

**
IKM No. M/3452/6047/11/12

Test Report Form No.: SGS/TR/CP/013, Ver: 6.0, Effective Date: 07/07/2021

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Job Ref.

TEST RESULTS:

Test Part Description

Sample Description: -PLEASE REFER TO PAGE 1-

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

Test Parameter(s):	Unit	Test Method	Result	MDL	Limit
Dibutyl phthalate (DBP) (CAS No. 84-74-2)	mg/kg	With reference to IEC 62321-8:2017, determination of phthalates by GC-MS.	N.D.	50	Max 1000
Di(2-ethylhexyl) phthalate (DEHP) (CAS No. 117-81-7)	mg/kg	With reference to IEC 62321-8:2017, determination of phthalates by GC-MS.	N.D.	50	Max 1000
Benzyl butyl phthalate (BBP) (CAS No. 85-68-7)	mg/kg	With reference to IEC 62321-8:2017, determination of phthalates by GC-MS.	N.D.	50	Max 1000
Diisobutyl phthalate (DIBP) (CAS No. 84-69-5)	mg/kg	With reference to IEC 62321-8:2017, determination of phthalates by GC-MS.	N.D.	50	Max 1000

Note: (a) mg/kg = ppm; ug/kg = ppb (0.01 mg/kg = 10 ug/kg); 0.1wt% = 1000ppm

- (b) N.D. = Not Detected
- (c) MDL = Method Detection Limit
- (d) = Not regulated
- (e) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.
- (f) 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.

SIGNED FOR AND ON BEHALF OF SGS (MALAYSIA) SDN BHD

TAY SIAM PINE
TECHNICAL MANAGER
IKM No. M/3452/6047/11/12

Test Report Form No.: SGS/TR/CP/013, Ver: 6.0, Effective Date: 07/07/2021

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Job Ref.

TEST RESULTS BY CHEMICAL METHOD:

Test Part Description

Sample Description: -PLEASE REFER TO PAGE 1-

Test Parameter(s):	Unit	Test Method	Result	MDL
Dimethyl Fumarate (CAS No.:624-49-7)	mg/kg	With reference to US EPA 3550C method. Analysis was performed by GC/MS.	N.D.	0.1
Polychlorinated biphenyls(PCB)	mg/kg	In-house method SGS-TM-RSTS-O-015 with reference to EPA 3550C. Analysis was performed by GC-MS and/or GC-ECD	N.D.	0.5
Polychlorinated naphthalene(PCN)	mg/kg	In-house method SGS-TM-RSTS-O-015 with reference to EPA 3550C. Analysis was performed by GC-MS and/or GC-ECD	N.D.	5
Polychlorinated terphenyls(PCT)	mg/kg	In-house method SGS-TM-RSTS-O-015 with reference to EPA 3550C. Analysis was performed by GC-MS and/or GC-ECD	N.D.	5
Alkanes,C10-13,chloro(SCC P) (CAS No. :85535-84-8	mg/kg	With reference to EPA 3550C. Analysis was performed by GC-ECD	N.D.	100
Polyvinylchloride (PVC)	-	Analysis was performed by FTIR and FLAME Test	NEGATIVE	-
Antimony (Sb)	mg/kg	With reference to EPA Method 3052, and performed by ICP-OES.	N.D.	2
Beryllium (Be)	mg/kg	With reference to EPA Method 3052, and performed by ICP-OES.	4	2
Magnesium (Mg)	mg/kg	With reference to EPA Method 3052, and performed by ICP-OES.	N.D.	20
Arsenic (As)	mg/kg	With reference to EPA Method 3052, and performed by ICP-OES.	N.D.	2
Phosphorus, P	mg/kg	With reference to EPA3052,performed by ICP-OES	N.D.	20
Perfluorooctanoic acid (PFOA)	%	With reference to US EPA 3550C:2007. Analysis was performed by HPLC-MS	N.D.	0.001
Perfluorooctanesulfonic acid (PFOS)	%	With reference to US EPA 3550C:2007. Analysis was performed by HPLC-MS	N.D.	0.001

SIGNED FOR AND ON BEHALF OF SGS (MALAYSIA) SDN BHD

TAY SIAM PINE TECHNICAL MANAGER IKM No. M/3452/6047/11/12

Test Report Form No.: SGS/TR/CP/013, Ver. 6.0, Effective Date: 07/07/2021

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Job Ref. ■

Halogen	-	-	-	-
Halogen-Fluorine (F)	mg/kg	With reference to BS EN 14582:2016, analysis performed by IC method for Fluorine content.	N.D.	50
Halogen-Chlorine (CI)	mg/kg	With reference to BS EN 14582:2016, analysis performed by IC method for Chlorine content.	N.D.	50
Halogen-Bromine (Br)	mg/kg	With reference to BS EN 14582:2016, analysis performed by IC method for Bromine content.	N.D.	50
Halogen-lodine (I)	mg/kg	With reference to BS EN 14582:2016, analysis performed by IC method for lodine content.	N.D.	50

Note: (a) mg/kg = ppm; ug/kg = ppb (0.01 mg/kg = 10 ug/kg); 0.1wt% = 1000ppm

(b) N.D. = Not Detected

(c) MDL = Method Detection Limit

(d) Negative = Undetectable / Positive = Detectable

TEST RESULTS BY CHEMICAL METHOD:

Test Part Description

Sample Description: -PLEASE REFER TO PAGE 1-

Test Parameter(s):	Unit	Test Method	Result	MDL
Phthalates	-	-	-	-
Di-n-octyl phthalate (DNOP) (CAS No. 117-84-0)	mg/kg	With reference to IEC 62321-8:2017, determination of phthalates by GC-MS.	N.D.	50
Di-isononyl phthalate (DINP) (CAS No.: 2855-3-12-0;68515-48-0)	mg/kg	With reference to IEC 62321-8:2017, determination of phthalates by GC-MS.	N.D.	100
Di-n-hexyl phthalate (DnHP/DHEXP) (CAS No. 84-75-3)	mg/kg	In-house SGS-TM-RSTS-O-003 with reference to IEC 62321-8:2017. Analysis was performed by GC-MS.	N.D.	50
Bis (2-methoxyethyl) phthalate (DMEP) (CAS No.:117-82-8)	mg/kg	In-house SGS-TM-RSTS-O-003 with reference to IEC 62321-8:2017. Analysis was performed by GC-MS.	N.D.	50
Di-isodecyl phthalate (DIDP) (CAS No.: 2676-1-40-0,68515-49-1)	mg/kg	With reference to IEC 62321-8:2017, determination of phthalates by GC-MS.	N.D.	100

Note: (a) mg/kg = ppm; ug/kg = ppb (0.01 mg/kg = 10 ug/kg); 0.1wt% = 1000ppm

(b) N.D. = Not Detected

(c) MDL = Method Detection Limit

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10871 TAY SIAM PINE TECHNICAL MANAGÈR IKM No. M/3452/6047/11/12

Test Report Form No.: SGS/TR/CP/013, Ver. 6.0. Effective Date: 07/07/2021

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TEST REPORT:

No.	
Inh Ref I	

REPORTED DATE: 25-August-2023

Test Part Description:

Sample Description: -PLEASE REFER TO PAGE 1-



SIGNED FOR AND ON BEHALF OF SGS (MALAYSIA) SDN BHO SGS (MALAYSIA) SDN BHO SGS (MALAYSIA) SGS (MA

TECHNICAL MANAGER IKM No. M/3452/6047/11/12

Test Report Form No.: SGS/TR/CP/013, Ver. 6.0, Effective Date: 07/07/2021

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No.

Job Ref.

REPORTED DATE: 25-August-2023

1. DETERMINATION OF CADMIUM CONTENT BY IEC 62321-5 2013

Sample Receiving and Registration

Sample Preparation

Weigh sample (0.2-0.5g) into digestion vessel

Acid digestion (Hotplate)

"Totally Dissolved"

Filtration

Analyses by ICP

2. DETERMINATION OF LEAD CONTENT BY IEC 62321-5 2013

Sample Receiving and Registration

Sample Preparation

Weigh sample (0.2-0.5g) into digestion vessel

Acid digestion (Hotplate)

"Totally Dissolved"

Filtration

Analyses by ICP

3. DETERMINATION OF MERCURY CONTENT BY IEC 62321-4 2013/AMD1 2017

Sample Receiving and Registration

Sample Preparation

Weigh sample (0.1-0.5g) into digestion vessel

Acid digestion (Hotplate)

"Totally Dissolved"

Filtration

Analyses by ICP

4. DETERMINATION OF HEXAVALENT CHROMIUM BY IEC 62321-7-1 2015

Sample Receiving and Registration

Sample Preparation

Boiling-water-extraction

Analyses by UV-Spectrophotometer

Test Report

5. DETERMINATION OF PBB/PBDE WITH GC-MS

Sample Preparation

Weigh sample (0.5-4.0g) into extraction thimble

Soxhlet Extraction with Toluene

Filter through 0.45 um membrane filter

Analyses by GC-MS (with appropriate dilution)

BY IEC 62321-6 2015

SIGNED FOR AND ON BEHALF OF

SGS (MALAYSIA) SDN BHD SGS 10871-1 TAY SIAM PINE TECHNICAL MANAGÈR IKM No. M/3452/6047/11/12

Test Report Form No.: SGS/TR/CP/013, Ver. 6.0, Effective Date: 07/07/2021

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No. Dob Ref.

REPORTED DATE: 25-August-2023

DETERMINATION OF HBCDD CONTENT

Sample preparation

Weigh sample (0.5 - 4.0g) into extraction thimble

Solvent extraction with Toluene

Filter through 0.45 µm membrane filter

Analysis by GC-MS (with appropriate dilution)

DETERMINATION OF PHTHALATES WITH GC-MS BY IEC 62321-8:2017

Sample Cutting / Preparation

Ψ

Sample Measurement



Solvent Extraction



Concentrate / Dilute extracted solution



GC-MS analysis



DATA

SIGNED FOR AND ON BEHALF OF SGS (MALAYSIA) SDN BHD

TAY SIAM PINE
TECHNICAL MANAGER
IKM No. M/3452/6047/11/12

Test Report Form No.: SGS/TR/CP/013, Ver. 6.0, Effective Date: 07/07/2021

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No. Job Ref.

REPORTED DATE: 25-August-2023

MICROWAVE ASSISTED ACID DIGESTION OF SILICEOUS AND ORGANICALLY BASED METRICES BY US EPA 3052

Sample Preparation

Weight sample (0.2-0.5g) into digestion vessel

Acid digestion

"Totally Dissolved"

Analyses by ICP

Filtration

PVC DETECTION WITH FTIR

Sample preparation (apply ATR for analysis)

FT-IR Scanning

Report

DETERMINATION OF HALOGEN CONTENT

Sample pre-treatment

Weighting and putting sample in cell

Combustion / Absorption

Dilution to fixed volume

Analyses by IC

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No. Job Ref.

REPORTED DATE: 25-August-2023

DETERMINATION OF DIMETHYL FUMARATE

Sample pre-treatment / separation

Sample extraction by organic solvent

Concentrate / Dilute extracted solution

Analysis performed by GC/MS

Data

DETERMINATION OF PFOS AND PFOA CONTENTS

Sample pre-treatment / separation

Solvent extraction

Concentrate / Dilute extracted solution

Sample filtration

Analysis performed by LC/MS

Data

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TAY SIAM PINE
TECHNICAL MANAGER
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*** End of test report ***

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TI Report Number: 60370390

Component : Die Attach Adhesive

Analysis Type: Halogens

Analysis Date: 06/19/2023



Test Report No.: Date: Jun 19, 2023 Page 1 of 4

Client Name:

Client Address:

Sample Name:

Style/Item No.:

Sample Description: Adhesive

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

SGS Job No.:

Sample Receiving Date: Jun 12, 2023

Testing Period: Jun 12, 2023 ~ Jun 19, 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).

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

Annie Lin

Annie Liu

Approved Signatory



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Test Report No.: Page 2 of 4 **Date:** Jun 19, 2023

Test Result(s):

Test Part Description:

SN ID	Sample No.	SGS Sample ID	Description
SN1	A6	SHA23-0080024-0001.C006	Gray paste

Remarks:

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

Antimony (Sb)

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

Test Item(s)	Unit(s)	MDL	A6
Antimony (Sb)	mg/kg	2	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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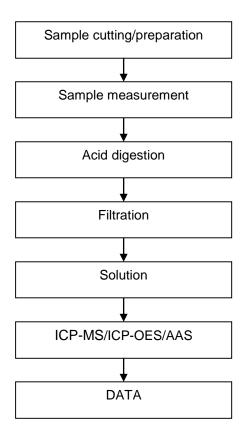
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No.:

Date: Jun 19, 2023 Page 3 of 4

Elements Testing Flow Chart





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Test Report	No.:	Date: Jun 19, 2023	Page 4 of 4



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TI Report Number: 60370388

Component : Die Attach Adhesive

Analysis Type: RoHS 10

Analysis Date: 06/19/2023



Test Report No.: Date: Jun 19, 2023 Page 1 of 10

Client Name:

Client Address:

Sample Name:
Style/Item No.:

Sample Description: Adhesive

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

SGS Job No.:

Sample Receiving Date: Jun 12, 2023

Testing Period: Jun 12, 2023 ~ Jun 19, 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
Hexabromocyclododecane (HBCDD)	See Results
Beryllium (Be)	See Results
Phthalates Content	See Results
RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU	Pass

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

Annie Lin

Annie Liu

Approved Signatory



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Test Report No.: **Date:** Jun 19, 2023 Page 2 of 10

Test Result(s):

Test Part Description:

SN ID	Sample No.	SGS Sample ID	Description
SN1	A6	SHA23-0080024-0001.C006	Gray paste

Remarks:

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

Hexabromocyclododecane (HBCDD)

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

Test Item(s)	CAS No.	Unit(s)	MDL	A6
	134237-50-6			
Hexabromocyclododecane (HBCDD)	/134237-51-7			
and all major diastereoisomers identified	/134237-52-8	mg/kg	20	ND
(α-HBCDD, β-HBCDD, γ-HBCDD)	/25637-99-4			
	/3194-55-6			

Beryllium (Be)

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

Test Item(s)	Unit(s)	MDL	A6
Beryllium (Be)	mg/kg	2	ND

Phthalates Content

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

Test Item(s)	CAS No.	Unit(s)	MDL	A6
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

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

Test Method:

- (1) With reference to IEC 62321-5:2013, determination of Cadmium by ICP-OES.
- (2) With reference to IEC 62321-5:2013, determination of Lead by ICP-OES.
- (3) With reference to IEC 62321-4:2013+AMD1:2017, determination of Mercury by ICP-OES.



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Test Report

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(4) With reference to IEC 62321-7-2:2017, determination of Hexavalent Chromium by UV-

- (5) With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS.
- (6) With reference to IEC 62321-8:2017, determination of phthalates by GC-MS.

Test Item(s)	Limit	Unit(s)	MDL	A6
Cadmium(Cd)	100	mg/kg	2	ND
Lead(Pb)	1000	mg/kg	2	ND
Mercury(Hg)	1000	mg/kg	2	ND
Hexavalent Chromium(Cr(VI))	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
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.
- IEC 62321 series is equivalent to EN 62321 series
- (2) 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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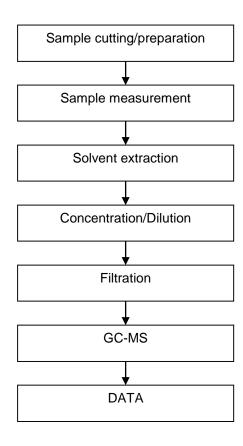
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HBCDD Testing Flow Chart





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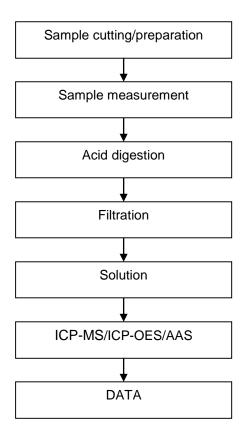
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Elements Testing Flow Chart





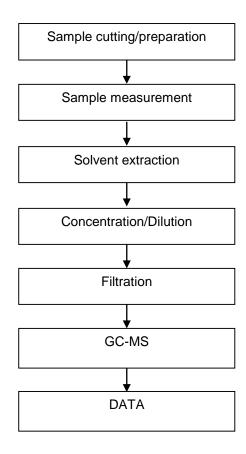
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Phthalates Testing Flow Chart





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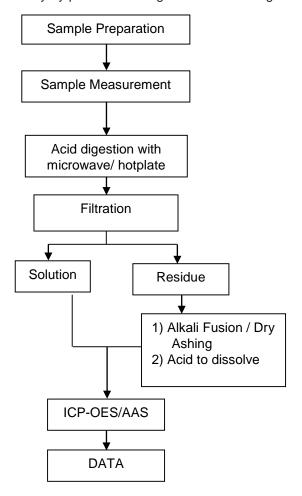
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Elements Testing Flow Chart

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





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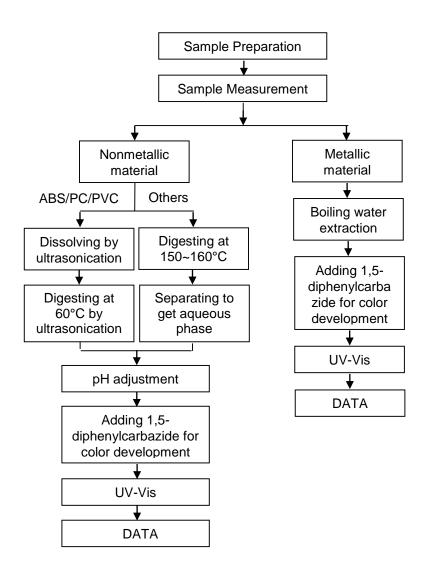
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Hexavalent Chromium (Cr(VI)) Testing Flow Chart





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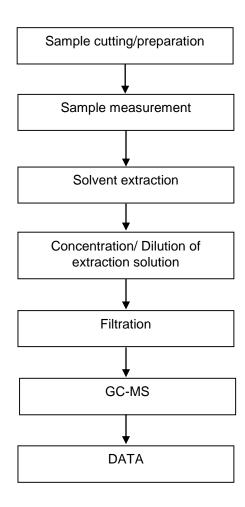
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PBBs/PBDEs Testing Flow Chart





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Sample Photo:





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