

Test Report

No.: ETR22204436

Date: 24-Feb-2022

Page: 1 of 24

SHOWA DENKO MATERIALS CO., LTD.
5-1 SUNAYAMA, KAMISU-SHI, IBARAKI 314-0255, JAPAN

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

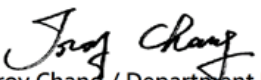
Sample Submitted By : SHOWA DENKO MATERIALS CO., LTD.
Sample Name : LIQUID SOLDER RESIST FOR PRINTED WIRING BOARD
Style/Item No. : SR7300GR-B=>SR7300G-B/CT7300A-B, SR7300GR-B/CT7300A-B

=====
Sample Receiving Date : 18-Feb-2022
Testing Period : 18-Feb-2022 to 24-Feb-2022

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.


Troy Chang / Department Manager
Signed for and on behalf of
SGS TAIWAN LTD.
Chemical Laboratory - Taipei



PIN CODE: C7263BB9

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Test Report

No.: ETR22204436

Date: 24-Feb-2022

Page: 2 of 24

SHOWA DENKO MATERIALS CO., LTD.
5-1 SUNAYAMA, KAMISU-SHI, IBARAKI 314-0255, JAPAN

Test Part Description

No.1 : GREEN PASTE

Test Result(s)

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Cadmium (Cd) (CAS No.: 7440-43-9)	With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.	mg/kg	2	n.d.	100
Lead (Pb) (CAS No.: 7439-92-1)	With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.	mg/kg	2	n.d.	1000
Mercury (Hg) (CAS No.: 7439-97-6)	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) (CAS No.: 18540-29-9)	With reference to IEC 62321-7-2: 2017, analysis was performed by UV-VIS.	mg/kg	8	n.d.	1000
Monobromobiphenyl	With reference to IEC 62321-6: 2015, analysis was performed by GC/MS.	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		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.	-
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 Report

No.: ETR22204436

Date: 24-Feb-2022

Page: 3 of 24

SHOWA DENKO MATERIALS CO., LTD.

5-1 SUNAYAMA, KAMISU-SHI, IBARAKI 314-0255, JAPAN

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Butyl benzyl phthalate (BBP) (CAS No.: 85-68-7)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Dibutyl phthalate (DBP) (CAS No.: 84-74-2)		mg/kg	50	n.d.	1000
Di-(2-ethylhexyl) phthalate (DEHP) (CAS No.: 117-81-7)		mg/kg	50	n.d.	1000
Diisobutyl phthalate (DIBP) (CAS No.: 84-69-5)		mg/kg	50	n.d.	1000
Diisodecyl phthalate (DIDP) (CAS No.: 26761-40-0, 68515-49-1)		mg/kg	50	n.d.	-
Diisononyl phthalate (DINP) (CAS No.: 28553-12-0, 68515-48-0)		mg/kg	50	n.d.	-
Di-n-octyl phthalate (DNOP) (CAS No.: 117-84-0)		mg/kg	50	n.d.	-
Bis(2-methoxyethyl) phthalate (DMEP) (CAS No.: 117-82-8)		mg/kg	50	n.d.	-
Diisopentyl phthalate (DIPP) (CAS No.: 605-50-5)		mg/kg	50	n.d.	-
Di-n-heptyl phthalate (CAS No.: 3648-21-3)		mg/kg	50	n.d.	-
1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters (DHNUP) (CAS No.: 68515-42-4)		mg/kg	50	n.d.	-
1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich (DIHP) (CAS No.: 71888-89-6)		mg/kg	50	n.d.	-
Di-n-pentyl phthalate (DNPP) (CAS No.: 131-18-0)		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: 2008, analysis was performed by GC/MS.	mg/kg	5	n.d.	-

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Test Report

No.: ETR22204436

Date: 24-Feb-2022

Page: 4 of 24

SHOWA DENKO MATERIALS CO., LTD.

5-1 SUNAYAMA, KAMISU-SHI, IBARAKI 314-0255, JAPAN

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Fluorine (F) (CAS No.: 14762-94-8)	With reference to BS EN 14582: 2016, analysis was performed by IC.	mg/kg	50	n.d.	-
Chlorine (Cl) (CAS No.: 22537-15-1)		mg/kg	50	292	-
Bromine (Br) (CAS No.: 10097-32-2)		mg/kg	50	n.d.	-
Iodine (I) (CAS No.: 14362-44-8)		mg/kg	50	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.	-
PFOA and its salts (CAS No.: 335-67-1 and its salts)		mg/kg	0.01	n.d.	-
Polychlorinated biphenyls (PCBs)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	0.5	n.d.	-
Polychlorinated naphthalene (PCNs)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	5	n.d.	-
Polychlorinated terphenyls (PCTs)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	0.5	n.d.	-
Short Chain Chlorinated Paraffins(C10-C13) (SCCP) (CAS No.: 85535-84-8)	With reference to ISO 18219: 2015, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Tetrabromobisphenol A (TBBP-A) (CAS No.: 79-94-7)	With reference to RSTS-E&E-121, analysis was performed by LC/MS.	mg/kg	10	n.d.	-
TBBP-A-bis (CAS No.: 21850-44-2)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	5	n.d.	-
Bisphenol A (CAS No.: 80-05-7)	With reference to RSTS-CHEM-239-1, analysis was performed by LC/MS/MS.	mg/kg	1	n.d.	-
Tributyl tin (TBT)	With reference to ISO 17353: 2004, analysis was performed by GC/FPD.	mg/kg	0.03	n.d.	-
Bis(tributyltin) oxide (TBTO) (CAS No.: 56-35-9)	Calculated from the result of Tributyl Tin (TBT).	mg/kg	0.03▲	n.d.	-
Triphenyl tin (TPT)	With reference to ISO 17353: 2004, analysis was performed by GC/FPD.	mg/kg	0.03	n.d.	-
Dibutyl tin (DBT)	With reference to ISO 17353: 2004, analysis was performed by GC/FPD.	mg/kg	0.03	n.d.	-
Dioctyl tin (DOT)	With reference to ISO 17353: 2004, analysis was performed by GC/FPD.	mg/kg	0.03	n.d.	-
AZO Dyes					
4-aminodiphenyl (CAS No.: 92-67-1)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-

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Test Report

No.: ETR22204436

Date: 24-Feb-2022

Page: 5 of 24

SHOWA DENKO MATERIALS CO., LTD.

5-1 SUNAYAMA, KAMISU-SHI, IBARAKI 314-0255, JAPAN

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Benzidine (CAS No.: 92-87-5)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-
4-chloro-o-toluidine (CAS No.: 95-69-2)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-
2-naphthylamine (CAS No.: 91-59-8)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-
o-aminoazotoluene (CAS No.: 97-56-3)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-
5-nitro-o-toluidine (CAS No.: 99-55-8)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-
4-chloroaniline (CAS No.: 106-47-8)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-
2,4-diaminoanisole (CAS No.: 615-05-4)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-
4,4'-diaminodiphenylmethane (MDA) (CAS No.: 101-77-9)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-
3,3'-dichlorobenzidine (CAS No.: 91-94-1)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-
3,3'-dimethoxybenzidine (CAS No.: 119-90-4)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-
3,3'-dimethylbenzidine (CAS No.: 119-93-7)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-
3,3'-dimethyl-4,4'-diaminodiphenylmethane (CAS No.: 838-88-0)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-

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Test Report

No.: ETR22204436

Date: 24-Feb-2022

Page: 6 of 24

SHOWA DENKO MATERIALS CO., LTD.

5-1 SUNAYAMA, KAMISU-SHI, IBARAKI 314-0255, JAPAN

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
2-methoxy-5-methylaniline (CAS No.: 120-71-8)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-
4,4'-methylene-bis-(2-chloroaniline) (CAS No.: 101-14-4)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-
4,4'-oxydianiline (CAS No.: 101-80-4)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-
4,4'-thiodianiline (CAS No.: 139-65-1)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-
o-toluidine (CAS No.: 95-53-4)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-
2,4-diaminotoluene (CAS No.: 95-80-7)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-
2,4,5-trimethylaniline (CAS No.: 137-17-7)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-
o-anisidine (CAS No.: 90-04-0)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-
4-aminoazobenzene (CAS No.: 60-09-3)	With reference to EN ISO 14362-1: 2017 or/and EN ISO 14362-3: 2017, analysis was performed by GC/MS & HPLC/DAD.	mg/kg	3	n.d.	-
2,4-xylidine (CAS No.: 95-68-1)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-
2,6-xylidine (CAS No.: 87-62-7)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-

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Test Report

No.: ETR22204436

Date: 24-Feb-2022

Page: 7 of 24

SHOWA DENKO MATERIALS CO., LTD.

5-1 SUNAYAMA, KAMISU-SHI, IBARAKI 314-0255, JAPAN

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Polyvinyl chloride (PVC)	With reference to ASTM E1252: 2013, analysis was performed by FT-IR and Flame Test.	**	-	Negative	-
Asbestos					
Actinolite (CAS No.: 77536-66-4)	With reference to EPA 600/R-93/116: 1993, analysis was performed by Stereo Microscope (SM), Dispersion Staining Polarized Light Microscope (DS-PLM) and X-ray Diffraction Spectrometer (XRD).	% (w/w)	-	Negative	-
Amosite (CAS No.: 12172-73-5)		% (w/w)	-	Negative	-
Anthophyllite (CAS No.: 77536-67-5)		% (w/w)	-	Negative	-
Chrysotile (CAS No.: 12001-29-5)		% (w/w)	-	Negative	-
Crocidolite (CAS No.: 12001-28-4)		% (w/w)	-	Negative	-
Tremolite (CAS No.: 77536-68-6)		% (w/w)	-	Negative	-
Red Phosphorus	Analysis was performed by Pyrolyzer-GC/MS.	**	-	Negative	-
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.	-
Chromium (Cr) (CAS No.: 7440-47-3)	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.	-
Selenium (Se) (CAS No.: 7782-49-2)	With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.	mg/kg	2	n.d.	-
Barium (Ba) (CAS No.: 7440-39-3)	With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.	mg/kg	2	83000	-

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Test Report

No.: ETR22204436

Date: 24-Feb-2022

Page: 8 of 24

SHOWA DENKO MATERIALS CO., LTD.

5-1 SUNAYAMA, KAMISU-SHI, IBARAKI 314-0255, JAPAN

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. Testing range of asbestos qualitative analysis is from less than 0.1% to 100%. The judgment criterion: asbestos fibers being found is shown as "Positive"; asbestos fibers not being found is shown as "Negative".
8. PFOS and its salts including :
CAS No.: 29081-56-9, 2795-39-3, 29457-72-5, 70225-14-8, 56773-42-3, 251099-16-8, 307-35-7.
9. PFOA and its salts including :
CAS No.: 3825-26-1, 335-95-5, 2395-00-8, 335-93-3, 335-66-0.
10. ▲ : The MDL was evaluated for element / tested substance.

Conversion Formula : $AX = A \times F$

AX	A	F
Bis(tributyltin)oxide (TBTO)	Tributyl Tin (TBT)	1.024

Parameter Conversion Table : https://eecloud.sgs.com/Region_TW/DocDownload.aspx#otherDoc

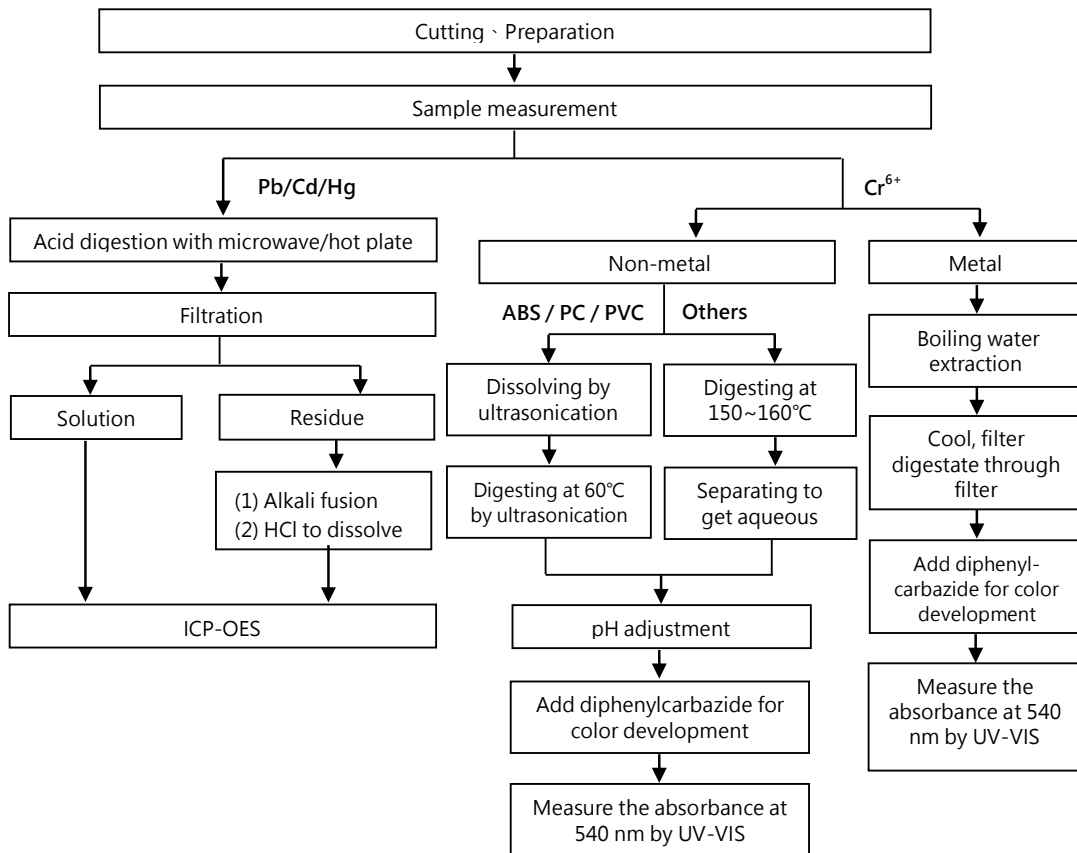
11. The statement of compliance conformity is based on comparison of testing results and limits.

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Analytical flow chart of Heavy Metal

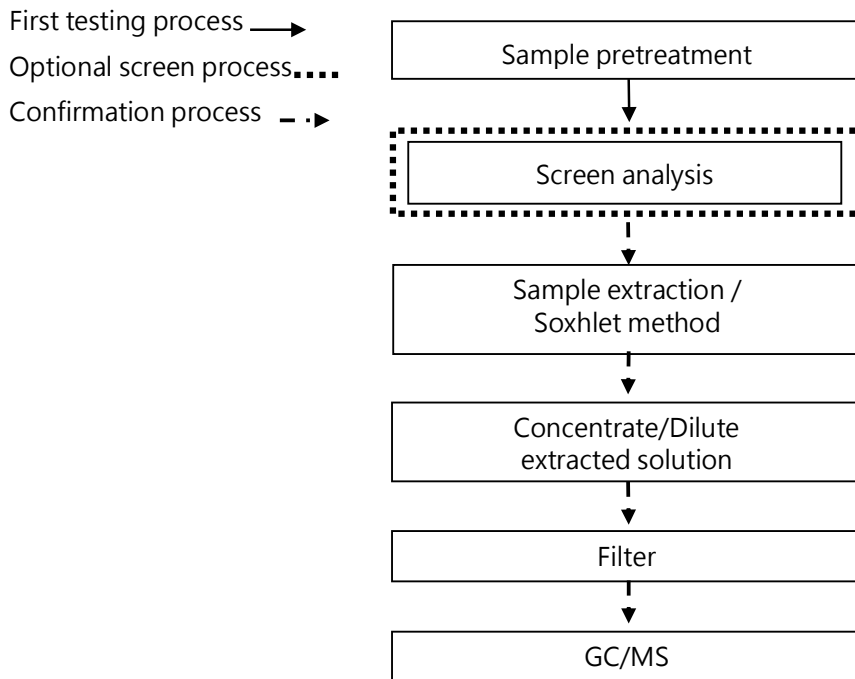
These samples were dissolved totally by pre-conditioning method according to below flow chart.

(Cr⁶⁺ test method excluded)



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Analytical flow chart – PBBs / PBDEs



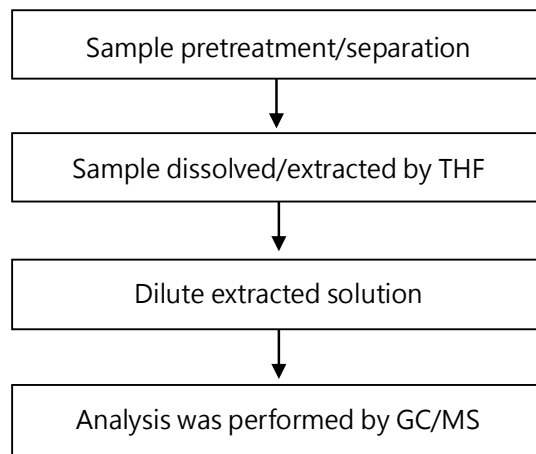
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5-1 SUNAYAMA, KAMISU-SHI, IBARAKI 314-0255, JAPAN

Analytical flow chart - Phthalate

【Test method: IEC 62321-8】

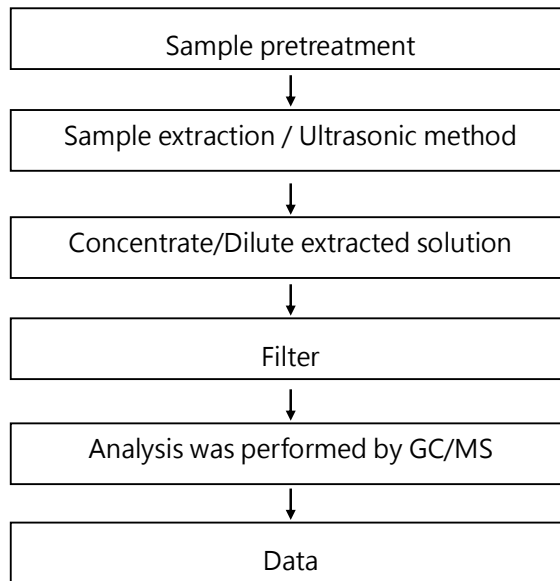


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Analytical flow chart - HBCDD

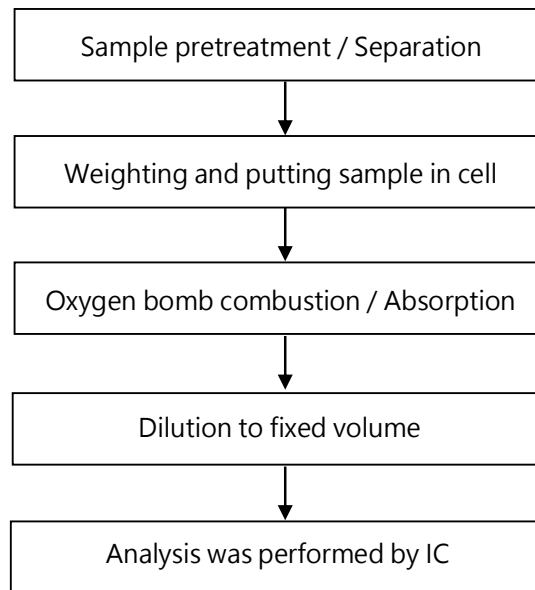


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Analytical flow chart - Halogen

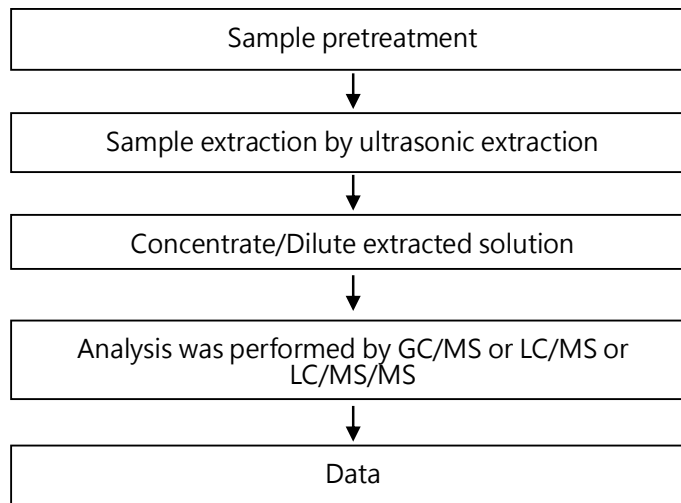


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Analytical flow chart – PFAS (including PFOA/PFOS/its related compound, etc.)



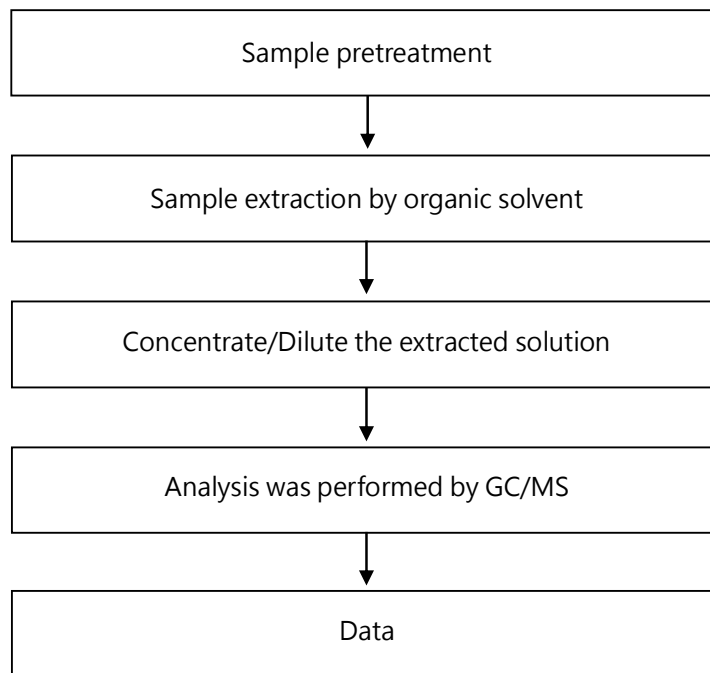
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Analytical flow chart

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

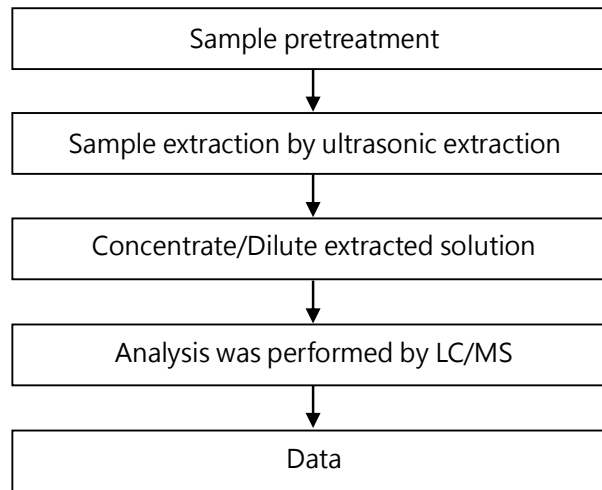


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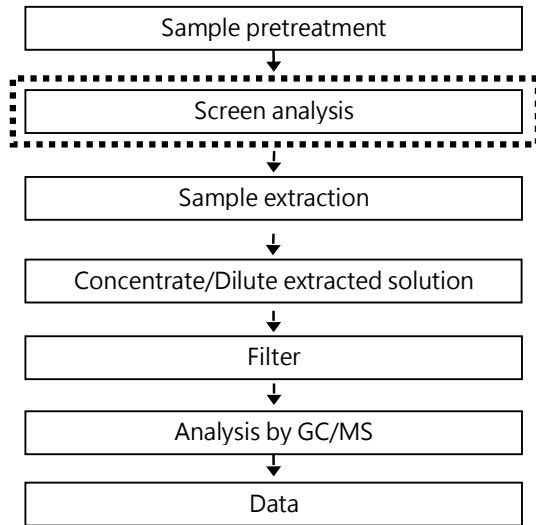
Analytical flow chart - TBBP-A



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Analytical flow chart - TBBP-A-bis

First testing process 
 Optional screen process 
 Confirmation process 

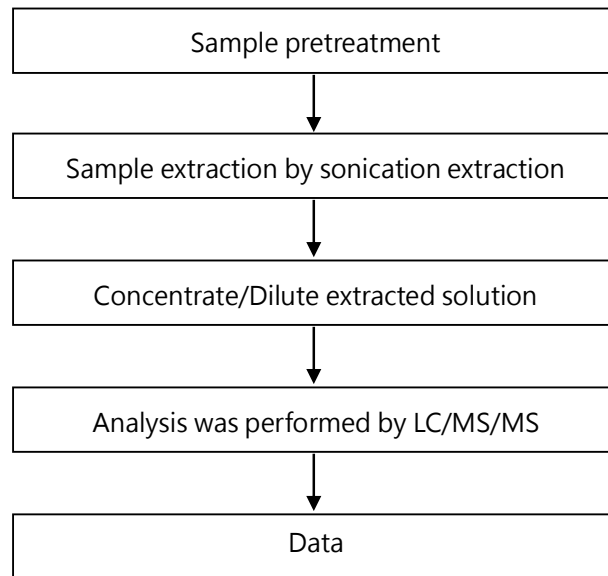


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Analytical flow chart - Bisphenol A

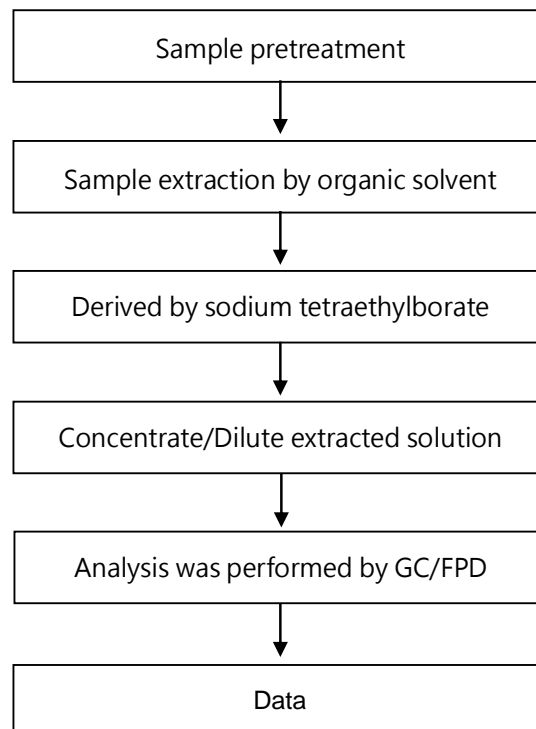


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Analytical flow chart - Organic-Tin

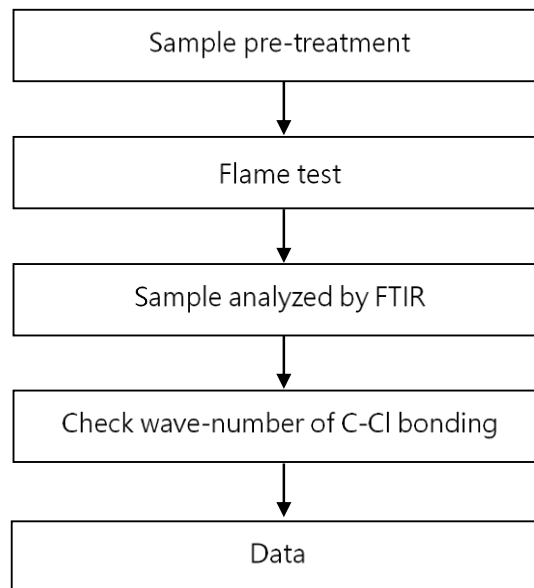


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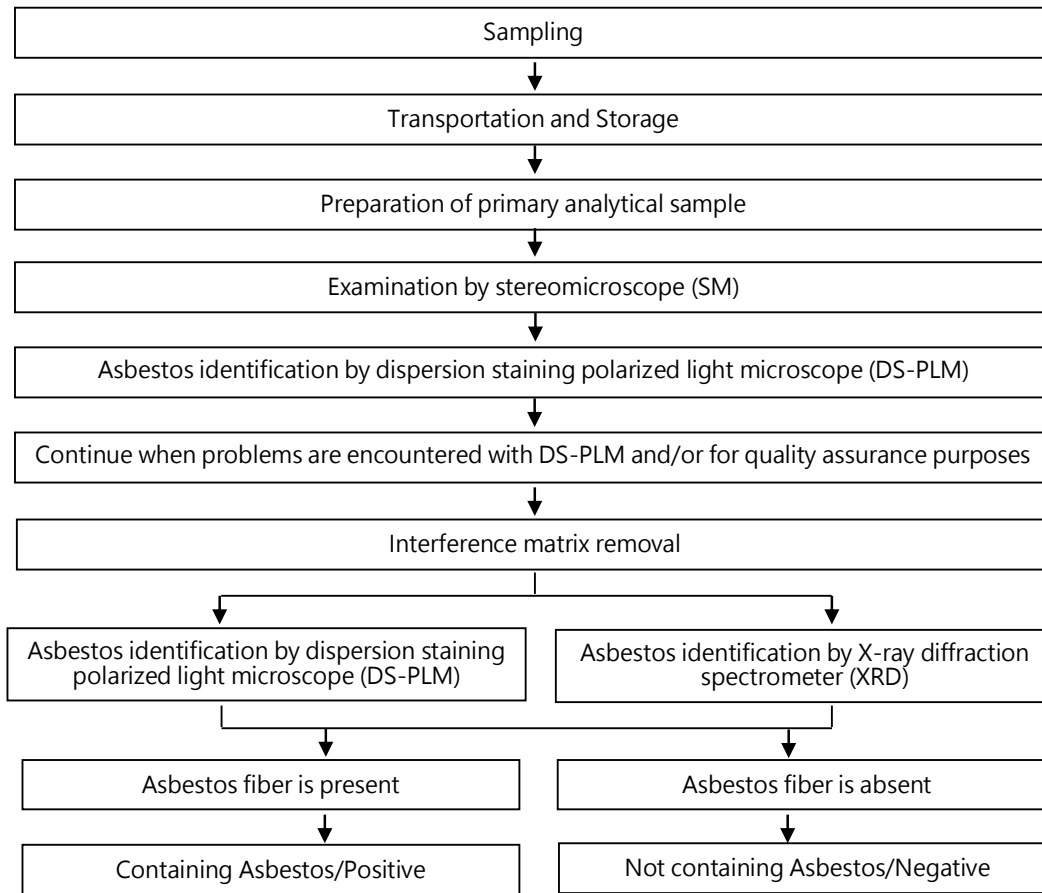
Analysis flow chart - PVC



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Analysis flow chart for determination of Asbestos

【Reference method: EPA 600/R-93/116】

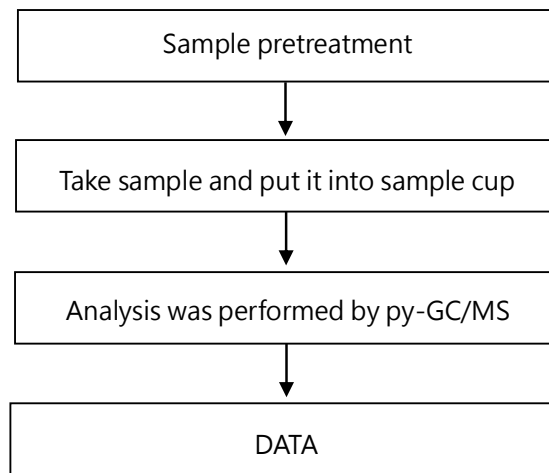


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Analytical flow chart - Red phosphorus

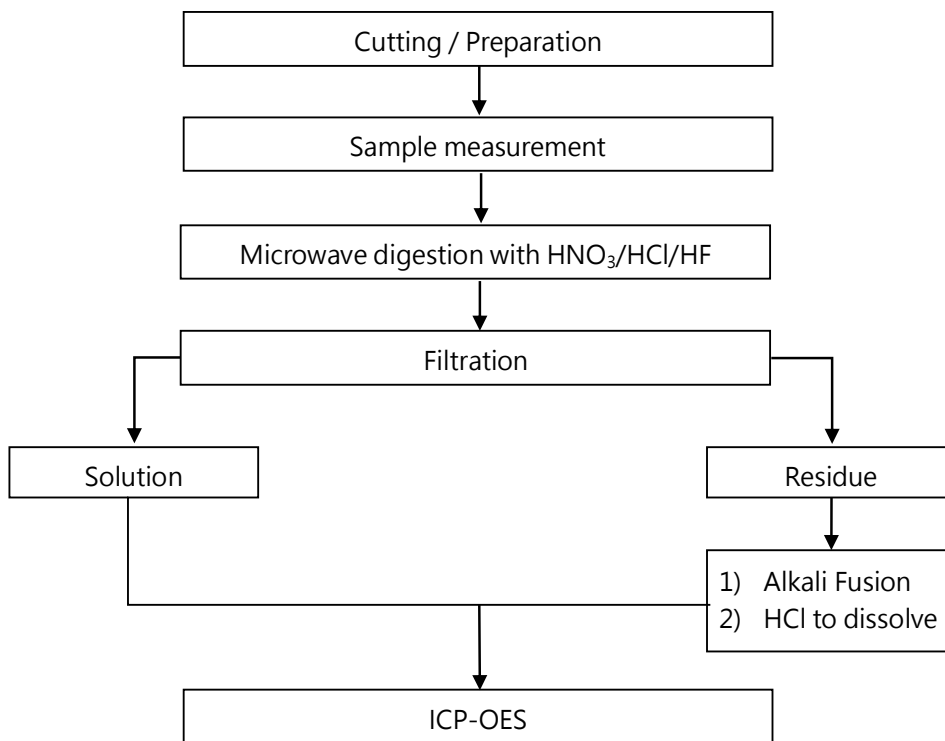


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Analytical flow chart of Elements (Heavy Metal included)

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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Test Report

No.: ETR22204436

Date: 24-Feb-2022

Page: 24 of 24

SHOWA DENKO MATERIALS CO., LTD.

5-1 SUNAYAMA, KAMISU-SHI, IBARAKI 314-0255, JAPAN

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

ETR22204436



** End of Report **

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