

Test Report

No.: CANEC24018843701

Date: Sep 10, 2024

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Client Name: LIYUAN BATTERY TECHNOLOGY (YI CHUN) CO.,LTD.

Client Address: LIYUAN SCIENCE AND TECHNOLOGY INDUSTRIAL PARK, 166 SHANGGAO COUNTY INDUSTRIAL PARK, YICHUN CITY, JIANGXI PROVINCE

Sample Name: CR2032 3V LITHIUM CELL

Client Ref. Information: CR2032, CR2025, CR2016, CR2020, CR2450, CR2430, CR2050, CR2477, CR1632, CR1620, CR1616, CR1625, CR1220, CR1225, CR1216, CR1025, CR927, CR2354, CR2330, CR123A, CR2, CR1/3, CR3032, CR3882, CR2032HT, CR1632HT, CR2450HT, CR2050HT, CR1620HT, CR1225HT, CR1220HT, CR1616HT, CR2016HT, CR2025HT, CR2477HT, CR1625HT, CR2032HR, CR1632HR, CR2450HR, CR2050HR, CR1620HR, CR1225HR, CR1220HR, CR1616HR, CR2025HR, CR2477HR.

Sample Type: portable batteries (non portable zinc-air button cells)

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

SGS Job No.: SZP24-038154

Sample Receiving Date: Aug 26, 2024

Testing Period: Aug 26, 2024 ~ Sep 05, 2024

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

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

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

Test Requirement	Conclusion
Entry 20 of Regulation (EU) No 276/2010 amending Annex XVII of REACH Regulation (EC) No 1907/2006 - Organostannic compounds	Pass
Entry 45 of Regulation (EC) No 552/2009 amending Annex XVII of REACH Regulation (EC) No 1907/2006 - Octabromodiphenyl ether (Octa-BDE)	Pass
Entry 68 of Regulation (EU) 2021/1297 amending Annex XVII of REACH Regulation (EC) No 1907/2006 - C9-C14 PFCAs, their salts and C9-C14 PFCa-related substances	Pass
Annex I of Regulation (EU) 2023/1542– Heavy Metals Content in batteries and waste batteries	Pass

Signed for and on behalf of
SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch

Jenny Liao
Approved Signatory

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SGS-CSTC Standards Technical Services Co., Ltd.
Guangzhou Branch, Chemical Laboratory.

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Test Requirement	Conclusion
Directive 2006/66/EC and its amendments, capacity labelling rules Regulation (EU) No 1103/2010, Regulation (EU) No 2023/1542 Article 13(4) & 13(5) – Labelling	Pass



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Test Result(s):

Test Part Description:

SN ID	Sample No.	SGS Sample ID	Description
SN1	A1	CAN24-0188437-0001.C001	Button cell

Remarks:

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

Entry 20 of Regulation (EU) No 276/2010 amending Annex XVII of REACH Regulation (EC) No 1907/2006 - Organostannic compounds

Test Method: With reference to ISO 17353:2004, analysis was performed by GC-MS.

Test Item(s)	Limit	Unit(s)	MDL	A1
Tributyltin(TBT) by Weight of Tin	-	%	0.01	ND
Triphenyltin(TPhT) by Weight of Tin	-	%	0.01	ND
Tricyclohexyltin(TCyT) by Weight of Tin	-	%	0.01	ND
Trioctyltin(TOT) by Weight of Tin	-	%	0.01	ND
Tripropyltin (TPT) by weight of Tin	-	%	0.01	ND
Trimethyltin(TMT) by Weight of Tin	-	%	0.01	ND
Σ of Tri substituted organotin compounds by Weight of Tin	0.1	%	-	ND
Dibutyltin(DBT) by Weight of Tin	0.1	%	0.01	ND
Diocetyl tin(DOT) by Weight of Tin	0.1	%	0.01	ND
Conclusion				Pass

Entry 45 of Regulation (EC) No 552/2009 amending Annex XVII of REACH Regulation (EC) No 1907/2006 - Octabromodiphenyl ether (Octa-BDE)

Test Method: With reference to IEC 62321-6:2015, analysis was performed by GC-MS.

Test Item(s)	Limit	Unit(s)	MDL	A1
Octabromodiphenyl ethers (OctaBDE)	1000	mg/kg	5	ND
Conclusion				Pass

Entry 68 of Regulation (EU) 2021/1297 amending Annex XVII of REACH Regulation (EC) No 1907/2006 - C9-C14 PFCAs, their salts and C9-C14 PFCa-related substances

Test Method: Modified EN 17681-1:2022 and EN 17681-2:2022, analysis was performed by LC-MS or LC-MS/MS and GC-MS.

Test Item(s)	CAS No.	Limit	Unit(s)	MDL	A1
C9-C14 PFCa, their salts					
Perfluorononane Acid (PFNA), its salts^	375-95-1	-	µg/kg	10	ND
Perfluorodecane Acid (PFDA), its salts^	335-76-2	-	µg/kg	10	ND



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Test Item(s)	CAS No.	Limit	Unit(s)	MDL	A1
Perfluoroundecanoic Acid (PFUnDA), its salts [^]	2058-94-8	-	µg/kg	10	ND
Perfluorododecanoic Acid (PFDoDA), its salts [^]	307-55-1	-	µg/kg	10	ND
Perfluorotridecanoic Acid (PFTrDA), its salts [^]	72629-94-8	-	µg/kg	10	ND
Perfluorotetradecanoic Acid (PFTDA), its salts [^]	376-06-7	-	µg/kg	10	ND
Perfluoro-3,7-dimethyloctanoic Acid (PF-3,7-DMOA)	172155-07-6	-	µg/kg	10	ND
Sum of C9-C14 PFCA, their salts	-	25	µg/kg	-	ND
C9-C14 PFCA-related substances					
Perfluorodecane sulfonic acid (PFDS), its salts [^]	335-77-3	-	µg/kg	10	ND
1H,1H,2H,2H-Perfluoro-1-dodecanol (10:2 FTOH)	865-86-1	-	µg/kg	100	ND
1H,1H,2H,2H-Perfluorododecylacrylate (10:2 FTA)	17741-60-5	-	µg/kg	100	ND
1H,1H,2H,2H-Perfluorododecyl methacrylate (10:2 FTMA)	2144-54-9	-	µg/kg	100	ND
1H,1H,2H,2H-perfluorotetradecan-1-ol (12:2 FTOH)	39239-77-5	-	µg/kg	100	ND
1H,1H,2H,2H-Perfluorododecane sulfonic acid (10:2 FTS), its salts [^]	120226-60-0	-	µg/kg	100	ND
1,1,2,2-Tetrahydroperfluorododecyl iodide (10:2 FTI)	2043-54-1	-	µg/kg	100	ND
1H,1H,2H,2H-Perfluorotetradecyl iodide (12:2 FTI)	30046-31-2	-	µg/kg	100	ND
Perfluorononane sulfonic acid (PFNS), its salts [^]	68259-12-1	-	µg/kg	10	ND
Perfluoroundecane sulfonic acid (PFUnDS), its salts [^]	749786-16-1	-	µg/kg	10	ND
Perfluorododecane sulfonic acid (PFDoDS), its salts [^]	79780-39-5	-	µg/kg	10	ND
Perfluorotridecane sulfonic acid (PFTrDS), its salts [^]	791563-89-8	-	µg/kg	10	ND
10:2 Fluortelomerphosphatediester (10:2 diPAP), its salts [^]	1895-26-7	-	µg/kg	100	ND
Perfluorodecyl iodide (PFDI)	423-62-1	-	µg/kg	100	ND
Perfluorododecyl iodide (PFDoDI)	307-60-8	-	µg/kg	100	ND
2H-Perfluoro-2-dodecenoic acid (10:2 FTUCA)	70887-94-4	-	µg/kg	100	ND
2-Perfluorodecyl ethanoic acid (10:2 FTCA)	53826-13-4	-	µg/kg	100	ND
1H,1H,2H,2H-perfluorododecyl acetate (10:2 FTOAc)	37858-05-2	-	µg/kg	100	ND
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS), its salts [^]	39108-34-4	-	µg/kg	10	ND
1H,1H,2H,2H-Perfluorodecyl acrylate (8:2 FTA)	27905-45-9	-	µg/kg	100	ND



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Test Item(s)	CAS No.	Limit	Unit(s)	MDL	A1
1H,1H,2H,2H-Perfluorodecyl methacrylate (8:2 FTMA)	1996-88-9	-	µg/kg	100	ND
2H,2H-Perfluorodecane Acid (8:2 FTCA), its salts [^]	27854-31-5	-	µg/kg	10	ND
1H,1H,2H,2H-Perfluoro-1-decanol (8:2 FTOH)	678-39-7	-	µg/kg	100	ND
1-Iodo-1H,1H,2H,2H-perfluorodecane (8:2 FTI)	2043-53-0	-	µg/kg	100	ND
1H,1H,2H,2H-Perfluorodecyltriethoxysilane (8:2 FTSi(OC ₂ H ₅) ₃)	101947-16-4	-	µg/kg	100	ND
bis(3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl) hydrogen phosphate (8:2 diPAP), its salts [^]	678-41-1	-	µg/kg	10	ND
2H,2H,3H,3H-Perfluoroundecanoic Acid (8:3 FTCA), its salts [^]	34598-33-9	-	µg/kg	10	ND
1H,1H,2H-Heptadecafluoro-1-decene (PFDE)	21652-58-4	-	µg/kg	100	ND
1H,1H,2H,2H-Perfluorodecyltrichlorosilane (8:2 FTSiCl ₃)/1H,1H,2H,2H-Perfluorodecyltrimethoxysilane (8:2 FTSi(OCH ₃) ₃)	78560-44-8 /83048-65-1	-	µg/kg	100	ND
1H,1H,2H,2H-perfluorodecyl acetate (8:2 FTOAc)	37858-04-1	-	µg/kg	100	ND
8:2 Fluorotelomer phosphate monoester (8:2 monoPAP) , its salts [^]	57678-03-2	-	µg/kg	100	ND
Sum of C9-C14 PFCA-related substances	-	260	µg/kg	-	ND
Conclusion					Pass

Notes:

- (1) 1µg/kg=1ppb.
- (2) Until 25 August 2024, the concentration limit shall be 2000 ppb for the sum of C9-C14 PFCAs in fluoroplastics and fluoroelastomers that contain perfluoroalkoxy groups. From 25 August 2024, the concentration limit shall be 100 ppb for the sum of C9-C14 PFCAs, in fluoroplastics and fluoroelastomers that contain perfluoroalkoxy groups.
- (3) The concentration limit shall be 1000ppb for the sum of C9-C14 PFCAs, where these are present in PTFE micro powders produced by ionising irradiation or by thermal degradation, as well as in mixtures and articles for industrial and professional uses containing PTFE micro powders.
- (4) [^]=Substances refer to its salts/derivative listed in below table.

Substance Name	CAS No.
PFNA, its salts	
Perfluorononane Acid (PFNA)	375-95-1
Perfluorononanoate Na-Salt (PFNA-Na)	21049-39-8
Nonanoic acid, heptadecafluoro-, ammonium salt (PFNA-NH ₄)	4149-60-4
Potassium perfluorononanoate (PFNA-K)	21049-38-7
Perfluorononanoate Li-Salt (PFNA-Li)	60871-92-3
Silver perfluorononanoate (PFNA-Ag)	7358-16-9
Methanaminium perfluorononanoate (PFNA-NH ₃ (CH ₃))	77032-23-6



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Nonanoic acid, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,9-heptadecafluoro-, compd. with N-ethylethanamine (1:1) PFNA-NH ₂ (C ₂ H ₅) ₂	77032-27-0
Nonanoic acid, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,9-heptadecafluoro-, compd. with N-methylmethanamine (1:1) (PFNA-NH ₂ (CH ₃) ₂)	77032-24-7
Nonanoic acid, heptadecafluoro-, compd. with N,N-diethylethanamine (1:1) (9CI) (PFNA-NH(C ₂ H ₅) ₃)	327176-80-7
Nonanoic acid, heptadecafluoro-, compd. with piperidine (1:1) (9CI) (PFNA-NH ₂ (C ₅ H ₁₀))	95682-66-9
Nonanoic acid, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,9,9,9-heptadecafluoro-, compd. with benzenamine (1:1) (PFNA-NH ₃ (C ₆ H ₅))	95682-67-0
Nonanoic acid, heptadecafluoro-, compd. with cyclohexanamine (1:1) (9CI) (PFNA-NH ₃ (C ₆ H ₁₁))	328531-06-2
Perfluorononanoate (anion)	72007-68-2
4-[(6-Methoxy-3-pyridazinyl)sulfamoyl]anilinium heptadecafluorononanoate (PFNA-C ₁₁ H ₁₂ N ₄ O ₃ S)	298703-33-0
Perfluorononanoic anhydride (PFNAA)	228407-54-3
PFDA, its salts	
Perfluorodecane Acid (PFDA)	335-76-2
Sodium perfluorodecanoate (PFDA-Na)	3830-45-3
Perfluorodecanoate ammonium salt (PFDA-NH ₄)	3108-42-7
Potassium perfluorodecanoate (PFDA-K)	51604-85-4
Silver perfluorodecanoate (PFDA-Ag)	5784-82-7
Lithium perfluorodecanoate (PFDA-Li)	84743-32-8
Perfluorodecanoate (anion)	73829-36-4
Perfluorodecanoic anhydride (PFDA)	942199-24-8
PFUnDA, its salts	
Perfluoroundecanoic Acid (PFUnDA)	2058-94-8
Perfluoroundecanoic acid sodium salt (PFUnDA-Na)	60871-96-7
Ammonium perfluoroundecanoate (PFUnDA-NH ₄)	4234-23-5
Potassium perfluoroundecanoate (PFUnDA-K)	30377-53-8
Calcium perfluoroundecanoate (PFUnDA-Ca)	97163-17-2
Perfluoroundecanoate (anion)	196859-54-8
PFDODA, its salts	
Perfluorododecanoic Acid (PFDODA)	307-55-1
Ammonium tricosafuorododecanoate (PFDODA-NH ₄)	3793-74-6
Sodium perfluorododecanoate (PFDODA-Na)	60872-01-7
Perfluorododecanoate (anion)	171978-95-3
PFTrDA, its salts	
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8
Ammonium perfluorotridecanoate (PFTrDA-NH ₄)	4288-72-6
Perfluorotridecanoate (anion)	862374-87-6
PFTDA, its salts	
Perfluorotetradecanoic Acid (PFTDA)	376-06-7
Perfluorotetradecanoate (anion)	365971-87-5
PFDS, its salts	
Perfluorodecane Sulfonate (PFDS)	335-77-3
Perfluorodecanesulfonate Na-salt (PFDS-Na)	2806-15-7
Perfluorodecanesulfonate K-salt (PFDS-K)	2806-16-8
Perfluorodecanesulfonic acid ammonium salt (PFDS-NH ₄)	67906-42-7
Perfluorodecane sulfonate (anion)	126105-34-8
Perfluorodecane sulfonic anhydride (PFDSA)	51667-62-0
PFNS, its salts	



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Perfluoro nonane sulfonic acid (PFNS)	68259-12-1
Sodium perfluoro-1-nonanesulfonate (PFNS-Na)	98789-57-2
ammonium nonadecafluorononanesulphonate (PFNS-NH ₄)	17202-41-4
Potassium perfluorononanesulfonate (PFNS-K)	29359-39-5
Perfluorononane sulfonate (anion)	474511-07-4
PFS, its salts	
Perfluoroundecane sulfonic acid (PFS)	749786-16-1
Perfluoroundecanesulfonate (anion)	441296-91-9
PFDS, its salts	
Perfluorododecanesulfonic acid (PFDS)	79780-39-5
Sodium perfluoro-1-dodecanesulfonate (PFDS-Na)	1260224-54-1
Potassium perfluorododecanesulfonate (PFDS-K)	85187-17-3
Perfluorododecane sulfonate (anion)	343629-43-6
PFTrDS, its salts	
Perfluorotridecane sulfonic acid (PFTrDS)	791563-89-8
Sodium perfluoro-1-tridecanesulfonate (PFTrDS-Na)	174675-49-1
10:2 diPAP, its salts	
10:2 Fluorotelomerphosphatediester (10:2 diPAP)	1895-26-7
Bis((perfluorodecyl)ethyl) hydrogen phosphate 2,2'-iminodiethanol (10:2 diPAP-C ₄ H ₁₁ O ₂)	57677-98-2
8:2 FTS, its salts	
1H,1H,2H,2H-Perfluorododecanesulfonic acid (8:2 FTS)	39108-34-4
Potassium 1H,1H,2H,2H-Perfluorododecane sulfonate (8:2 FTS-K)	438237-73-1
Ammonium 1H,1H,2H,2H-Perfluorododecane sulfonate (8:2 FTS-NH ₄)	149724-40-3
Sodium 1H,1H,2H,2H-Perfluorododecane sulfonate (8:2 FTS-Na)	27619-96-1
2-(Perfluorooctyl)ethane-1-sulfonate (8:2 FTS(anion))	481071-78-7
8:2 FTCA, its salts	
2H,2H-Perfluorodecane Acid (8:2 FTCA)	27854-31-5
Tetrabutylphosphonium 2H,2H-Perfluorodecanoate (8:2 FTCA-P(C ₄ H ₉) ₄)	882489-14-7
8:2 diPAP, its salts	
Bis(3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptafluorodecyl) hydrogen phosphate (8:2 diPAP)	678-41-1
Sodium bis(1H,1H,2H,2H-perfluorodecyl)phosphate (8:2 diPAP-Na)	114519-85-6
Bis(2-hydroxyethyl)ammonium bis((perfluorooctyl)ethyl) hydrogen phosphate	57677-97-1
Bis[2-(perfluorooctyl)ethyl] phosphate ammonium salt (8:2 diPAP-NH ₄)	93776-20-6
8:2 Fluorotelomer phosphate diester ion (1-)	1411713-91-1
8:3 FTCA, its salts	
2H,2H,3H,3H-Perfluoroundecanoic acid (8:3 FTCA)	34598-33-9
Potassium 2H,2H,3H,3H-Perfluoroundecanoate (8:3 FTCA-K)	83310-58-1
2H,2H,3H,3H-Perfluoroundecanoate (8:3 FTCA-Li)	67304-23-8
8:2 monoPAP, its salts	
8:2 Fluorotelomer phosphate monoester (8:2 monoPAP)	57678-03-2
Sodium 1H,1H,2H,2H-perfluorodecyl phosphate (8:2 monoPAP-Na)	92678-93-8

Annex I of Regulation (EU) 2023/1542– Heavy Metals Content in batteries and waste batteries

Test Method: SGS In House Method (GZTC CHEM-TOP-068), analysis was performed by ICP-OES or AAS or Hg-analyzer.



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Test Item(s)	Limit	Unit(s)	MDL	A1
Lead(Pb)	0.01	%	0.0010	ND
Cadmium(Cd)	0.002	%	0.0010	ND
Mercury(Hg)	0.0005	%	0.0001	ND
Conclusion				Pass

Notes:


(1) Restriction on substances

Column 1 Designation of the substance or group of substances	Column 2 Conditions of restriction
1. Mercury CAS No 7439-97-6 EC No 231-106-7 and its compounds	Batteries, whether or not incorporated into appliances, light means of transport or other vehicles, shall not contain more than 0,0005 % of mercury (expressed as mercury metal) by weight
2. Cadmium CAS No 7440-43-9 EC No 231-152-8 and its compounds	Portable batteries, whether or not incorporated into appliances, light means of transport or other vehicles, shall not contain more than 0,002 % of cadmium (expressed as cadmium metal) by weight
3. Lead CAS No 7439-92-1 EC No 231-100-4 and its compounds	1. From 18 August 2024, portable batteries, whether or not incorporated into appliances, shall not contain more than 0,01 % of lead (expressed as lead metal) by weight. 2. The restriction set out in point 1 shall not apply to portable zinc-air button cells until 18 August 2028.

(2) According to the EU New Battery Regulation (EU) 2023/1542, portable batteries (non portable zinc-air button cells) containing between 0,004 %-0.01 % lead, shall be marked with the chemical symbol for the metal concerned: Pb.



Directive 2006/66/EC and its amendments, capacity labelling rules Regulation (EU) No 1103/2010, Regulation (EU) No 2023/1542 Article 13(4) & 13(5) – Labelling

No.	Requirements	Findings	Conclusion
1	Member States shall ensure that all batteries, accumulators and battery packs are appropriately marked with the separate collection symbol: 	The symbol is marked on the battery.	PASS
2	Member States shall ensure that the capacity of all portable and automotive batteries and accumulators is indicated on them in a visible, legible and indelible form by 26 September 2009. For portable secondary (rechargeable) and automotive batteries and accumulators, COMMISSION REGULATION (EU) No 1103/2010 ANNEX III regulates information contained on capacity labels.	Battery type: primary battery or accumulator	N/A (Capacity requirement is not yet published)
3	Batteries containing more than 0,002 % cadmium or more than 0,004 % lead, shall be marked with the chemical symbol for the metal concerned: Cd or Pb. The chemical symbol shall be printed beneath the separate collection symbol and shall cover an area of at least one-quarter the size of whole that symbol.	Battery type: portable batteries Results of Cd, Pb: Cd: ND Pb: ND No chemical symbol marked	PASS



No.	Requirements	Findings	Conclusion
4	The separate collection symbol shall cover at least 3 % of the area of the largest side of the battery, accumulator or battery pack, up to a maximum size of 5 × 5 cm. In the case of cylindrical cells, the symbol shall cover at least 1,5 % of the surface area of the battery or accumulator and shall have a maximum size of 5 × 5 cm.	Battery type: non cylindrical battery, accumulator or battery pack Symbol area: 0.38 cm ² Largest side area: 3.11 cm ² Covered area: 12.22%	PASS
5	Symbols shall be printed visibly, legibly and indelibly.	The symbol is visible, legible and indelible.	PASS

Remark :

- 1) PASS = Meet the requirement
- 2) FAIL = Does not meet the requirement
- 3) N/A = Not applicable

The location of performance of the laboratory activities: A. No.198, Kezhu Road, Science City, Economic & Technological Development Area, Guangzhou, Guangdong; B. Room 101, Building 3, No.1501, Kaichuang Avenue, Huangpu District, Guangzhou, Guangdong
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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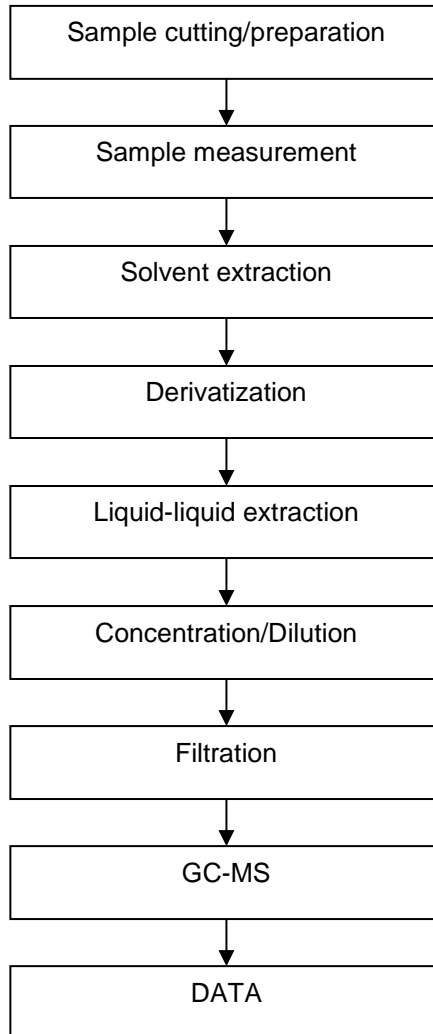
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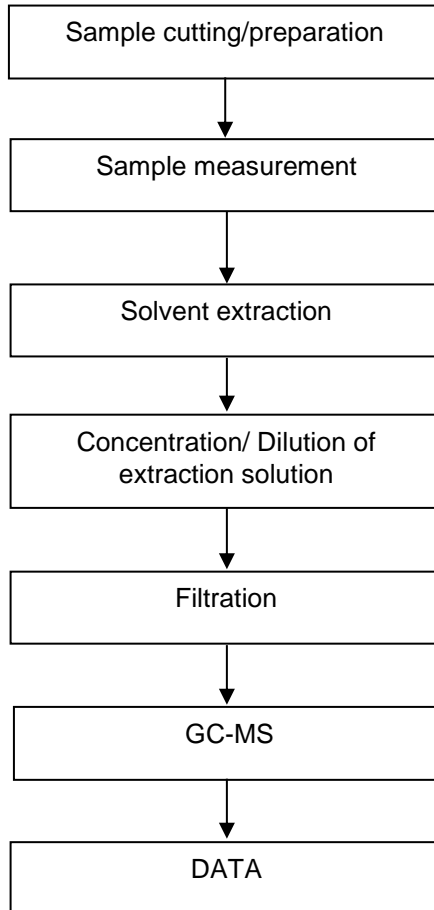
ATTACHMENTS

Organotin Testing Flow Chart

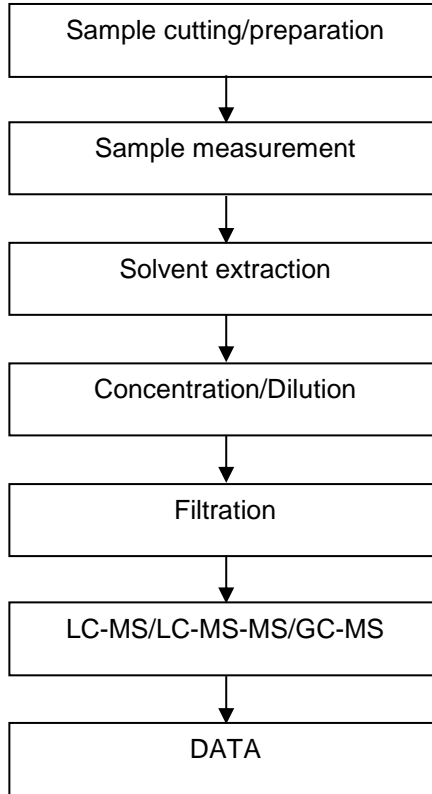


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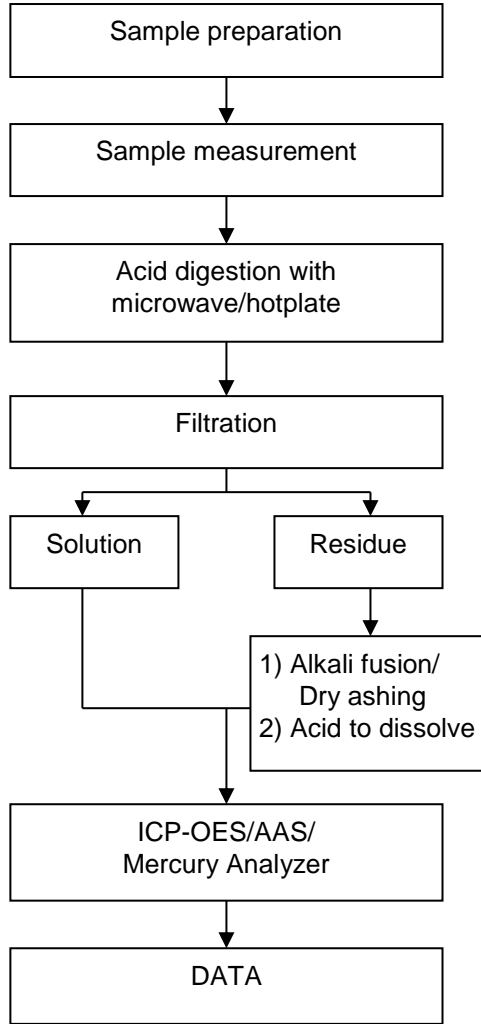
PBB/PBDE Testing Flow Chart



PFASs/ PFOS/PFOA Testing Flow Chart



Battery Testing Flow Chart



Sample Photo:





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