

Test Report

No.: SHAEC23007019401

Date: Jun 06, 2023

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Client Name: TSMC(CHINA)COMPANY LIMITED

Client Address: 4000,WENXIANG ROAD,SONGJIANG,SHANGHAI,CHINA

Sample Name: 8 inch Wafer

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

SGS Job No.: SP23-010209

Sample Receiving Date: May 29, 2023

Testing Period: May 29, 2023 ~ Jun 06, 2023

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

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

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

Test Requirement	Conclusion
EU RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU- Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs), Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP)	Pass
Alkanes C10-C13, chloro (short chain-chlorinated paraffins) (SCCPs)	See Results
Asbestos	See Results
Element(s)	See Results
Glycol Ethers	See Results
Halogen	See Results
Ozone Depleting Substances(ODS)	See Results
Polychlorinated Biphenyls(PCBs)	See Results
Polychlorinated Naphthalenes (PCNs)	See Results

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



Jenny Lan
Approved Signatory

scan to see the report



5FCFDA06



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Test Requirement	Conclusion
Polyvinyl chloride (PVC)	See Results
Radioactive element	See Results
Solvent Residue	See Results
TBBP-A	See Results
VOC	See Results
Organic-tin compounds	See Results
Perfluorooctane Sulfonates (PFOS) and its derivatives and Perfluorooctanoic Acid (PFOA) and its salts	See Results
Persistent, Bioaccumulative, and Toxic (PBT) Chemicals under US EPA Toxic Substances Control Act (TSCA) Section 6(h)	Pass
Azo Dyes	Pass

Test Result(s):

Test Part Description:

SN ID	Sample No.	SGS Sample ID	Description
SN1	A1	SHA23-0070194-0001.C001	Grey solid sheet

Remarks:

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

EU RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU- Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs), Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP)

Test Method: With reference to IEC 62321-4:2013+AMD1:2017, IEC 62321-5:2013, IEC 62321-7-2:2017, IEC 62321-6:2015 and IEC 62321-8:2017, analysis was performed by ICP-OES, UV-Vis and GC-MS.

Test Item(s)	Limit	Unit(s)	MDL	A1
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
Polybromobiphenyl (PBBs)	1000	mg/kg	-	ND
Monobromobiphenyl (MonoBB)	-	mg/kg	5	ND
Dibromobiphenyl (DiBB)	-	mg/kg	5	ND
Tribromobiphenyl (TriBB)	-	mg/kg	5	ND
Tetrabromobiphenyl (TetraBB)	-	mg/kg	5	ND
Pentabromobiphenyl (PentaBB)	-	mg/kg	5	ND



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Test Item(s)	Limit	Unit(s)	MDL	A1
Hexabromobiphenyl (HexaBB)	-	mg/kg	5	ND
Heptabromobiphenyl (HeptaBB)	-	mg/kg	5	ND
Octabromobiphenyl (OctaBB)	-	mg/kg	5	ND
Nonabromobiphenyl (NonaBB)	-	mg/kg	5	ND
Decabromobiphenyl (DecaBB)	-	mg/kg	5	ND
Polybromodiphenyl ether(PBDEs)	1000	mg/kg	-	ND
Monobromodiphenylether (MonoBDE)	-	mg/kg	5	ND
Dibromodiphenylether (DiBDE)	-	mg/kg	5	ND
Tribromodiphenylether (TriBDE)	-	mg/kg	5	ND
Tetrabromodiphenylether (TetraBDE)	-	mg/kg	5	ND
Pentabromodiphenylether (PentaBDE)	-	mg/kg	5	ND
Hexabromodiphenylether (HexaBDE)	-	mg/kg	5	ND
Heptabromodiphenylether (HeptaBDE)	-	mg/kg	5	ND
Octabromodiphenylether (OctaBDE)	-	mg/kg	5	ND
Nonabromodiphenylether (NonaBDE)	-	mg/kg	5	ND
Decabromodiphenylether (DecaBDE)	-	mg/kg	5	ND
Dibutyl Phthalate(DBP)	1000	mg/kg	50	ND
Benzyl Butyl Phthalate(BBP)	1000	mg/kg	50	ND
Bis-(2-ethylhexyl) Phthalate(DEHP)	1000	mg/kg	50	ND
Diisobutyl Phthalate(DIBP)	1000	mg/kg	50	ND

Notes:

- (1) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.
- (2) IEC 62321 series is equivalent to EN 62321 series.
- (3) 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.

Alkanes C10-C13, chloro (short chain-chlorinated paraffins) (SCCPs)

Test Method: With reference to ISO 18219-1:2021, analysis was performed by GC-NCI-MS.

Test Item(s)	CAS No.	Unit(s)	MDL	A1
Short Chain Chlorinated Paraffin(C10-C13)(SCCP)	85535-84-8	mg/kg	50	ND

Asbestos

Test Method: With reference to NIOSH 9000:2015 and ISO 22262-1:2012, analysis was performed by XRD/PLM.

Test Item(s)	CAS No.	Unit(s)	MDL	A1
Actinolite	77536-66-4	%(m/m)	0.1	Negative
Amosite	12172-73-5	%(m/m)	0.1	Negative
Anthophyllite	77536-67-5	%(m/m)	0.1	Negative
Chrysotile	12001-29-5 /132207-32-0	%(m/m)	0.1	Negative



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Test Item(s)	CAS No.	Unit(s)	MDL	A1
Crocidolite	12001-28-4	%(m/m)	0.1	Negative
Tremolite	77536-68-6	%(m/m)	0.1	Negative

Notes:

(1) Negative = the absence of asbestos, Positive = the presence of asbestos.

Element(s)

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

Test Item(s)	Unit(s)	MDL	A1
Arsenic(As)	mg/kg	10	ND
Beryllium(Be)	mg/kg	5	ND
Antimony(Sb)	mg/kg	10	ND

Glycol Ethers

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

Test Item(s)	CAS No.	Unit(s)	MDL	A1
Ethylene glycol dimethyl ether (EGDME)	110-71-4	mg/kg	10	ND
2-Methoxyethanol (EGME)	109-86-4	mg/kg	10	ND
2-Ethoxyethanol (EGEE)	110-80-5	mg/kg	10	ND
2-methoxypropyl acetate (1PG2MEA)	70657-70-4	mg/kg	10	ND
2-Methoxyethyl acetate (EGMEA)	110-49-6	mg/kg	10	ND
2-Ethoxyethyl acetate (EGEEA)	111-15-9	mg/kg	10	ND
2-(2-Methoxyethoxy)Ethanol (DEGME)	111-77-3	mg/kg	10	ND
Bis(2-methoxy ethyl)ether(DEGDME)	111-96-6	mg/kg	10	ND
Triethyl glycol dimethyl ether(TEGDME)	112-49-2	mg/kg	10	ND

Halogen

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

Test Item(s)	Unit(s)	MDL	A1
Fluorine(F)	mg/kg	20	ND
Chlorine(Cl)	mg/kg	50	ND
Bromine(Br)	mg/kg	50	ND
Iodine(I)	mg/kg	50	ND

Ozone Depleting Substances(ODS)

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



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Test Item(s)	CAS No.	Unit(s)	MDL	A1
CFC-11	75-69-4	µg/g	0.1	ND
CFC-12	75-71-8	µg/g	0.1	ND
CFC-113	354-58-5 /76-13-1	µg/g	0.1	ND
CFC-114	374-07-2 /76-14-2	µg/g	0.1	ND
CFC-13	75-72-9	µg/g	0.1	ND
CFC-111	354-56-3	µg/g	0.1	ND
CFC-112	76-11-9	µg/g	0.1	ND
CFC-113a	354-58-5	µg/g	0.1	ND
CFC-114a	374-07-2	µg/g	0.1	ND
CFC-115	76-15-3	µg/g	0.1	ND
CFC-211	422-78-6	µg/g	0.1	ND
CFC-212	661-96-1	µg/g	0.1	ND
CFC-213	1652-89-7	µg/g	0.1	ND
CFC-214	677-68-9	µg/g	0.1	ND
CFC-215	1599-41-3	µg/g	0.1	ND
CFC-216	661-97-2	µg/g	0.1	ND
CFC-217	422-86-6	µg/g	0.1	ND
HCFC-21	75-43-4	µg/g	0.1	ND
HCFC-22	75-45-6	µg/g	0.1	ND
HCFC-123	306-83-2	µg/g	0.1	ND
HCFC-124	2837-89-0	µg/g	0.1	ND
HCFC-141b	1717-00-6	µg/g	0.1	ND
HCFC-142b	75-68-3	µg/g	0.1	ND
HCFC-31	593-70-4	µg/g	0.1	ND
HCFC-121	354-14-3	µg/g	0.1	ND
HCFC-122	354-21-2	µg/g	0.1	ND
HCFC-123a	354-23-4	µg/g	0.1	ND
HCFC-124a	354-25-6	µg/g	0.1	ND
HCFC-131	359-28-4	µg/g	0.1	ND
HCFC-131a	811-95-0	µg/g	0.1	ND
HCFC-132a	471-43-2	µg/g	0.1	ND
HCFC-132b	1649-08-7	µg/g	0.1	ND
HCFC-133a	75-88-7	µg/g	0.1	ND
HCFC-221	422-26-4	µg/g	0.1	ND
HCFC-222	422-30-0	µg/g	0.1	ND
HCFC-223	422-52-6	µg/g	0.1	ND
HCFC-225ca	422-56-0	µg/g	0.1	ND
HCFC-225cb	507-55-1	µg/g	0.1	ND
HCFC-226	431-87-8	µg/g	0.1	ND
HCFC-231	421-94-3	µg/g	0.1	ND
HCFC-232	460-89-9	µg/g	0.1	ND
HCFC-233	7125-84-0	µg/g	0.1	ND
HCFC-234	425-94-5	µg/g	0.1	ND
HCFC-235	460-92-4	µg/g	0.1	ND
HCFC-241	666-27-3	µg/g	0.1	ND
HCFC-242	460-63-9	µg/g	0.1	ND
HCFC-243	338-75-0	µg/g	0.1	ND



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HCFC-244	679-85-6	µg/g	0.1	ND
HCFC-251	421-41-0	µg/g	0.1	ND
HCFC-252	819-00-1	µg/g	0.1	ND
HCFC-253	460-35-5	µg/g	0.1	ND
HCFC-261	7799-56-6	µg/g	0.1	ND
HCFC-271	430-55-7	µg/g	0.1	ND
HCFC-262	102738-79-4	µg/g	0.1	ND
Halon 1211	353-59-3	µg/g	0.1	ND
Halon 1301	75-63-8	µg/g	0.1	ND
Halon 2402	124-73-2	µg/g	0.1	ND
CHF ₂ Br	1511-62-2	µg/g	0.1	ND
CH ₂ FBr	373-52-4	µg/g	0.1	ND
C ₂ HFB ₄	-	µg/g	0.1	ND
C ₂ HF ₂ Br ₃	-	µg/g	0.1	ND
C ₂ HF ₃ Br ₂	354-04-1	µg/g	0.1	ND
C ₂ HF ₄ Br	-	µg/g	0.1	ND
C ₂ H ₂ FBr ₃	-	µg/g	0.1	ND
C ₂ H ₂ F ₂ Br ₂	75-82-1	µg/g	0.1	ND
C ₂ H ₂ F ₃ Br	421-06-7	µg/g	0.1	ND
C ₂ H ₃ FBr ₂	-	µg/g	0.1	ND
C ₂ H ₃ F ₂ Br	359-07-9	µg/g	0.1	ND
C ₂ H ₄ FBr	762-49-2	µg/g	0.1	ND
C ₃ HFB ₆	-	µg/g	0.1	ND
C ₃ HF ₂ Br ₅	-	µg/g	0.1	ND
C ₃ HF ₃ Br ₄	-	µg/g	0.1	ND
C ₃ HF ₄ Br ₃	-	µg/g	0.1	ND
C ₃ HF ₅ Br ₂	-	µg/g	0.1	ND
C ₃ HF ₆ Br	-	µg/g	0.1	ND
C ₃ H ₂ FBr ₅	-	µg/g	0.1	ND
C ₃ H ₂ F ₂ Br ₄	-	µg/g	0.1	ND
C ₃ H ₂ F ₃ Br ₃	-	µg/g	0.1	ND
C ₃ H ₂ F ₄ Br ₂	-	µg/g	0.1	ND
C ₃ H ₂ F ₅ Br	-	µg/g	0.1	ND
C ₃ H ₃ F ₃ Br ₂	-	µg/g	0.1	ND
C ₃ H ₃ F ₄ Br	-	µg/g	0.1	ND
C ₃ H ₄ FBr ₃	-	µg/g	0.1	ND
C ₃ H ₄ F ₂ Br ₂	-	µg/g	0.1	ND
C ₃ H ₄ F ₃ Br	-	µg/g	0.1	ND
C ₃ H ₅ FBr ₂	-	µg/g	0.1	ND
C ₃ H ₅ F ₂ Br	-	µg/g	0.1	ND
C ₃ H ₆ FBr	-	µg/g	0.1	ND
Dibromofluoromethane	1868-53-7	µg/g	0.1	ND
Methyl bromide	74-83-9	µg/g	0.1	ND
Bromochloromethane	74-97-5	µg/g	0.1	ND
HFC-23	75-46-7	µg/g	0.1	ND
HFC-32	75-10-5	µg/g	0.1	ND
HFC-41	593-53-3	µg/g	0.1	ND
HFC-43-10mee	138495-42-8	µg/g	0.1	ND
HFC-125	354-33-6	µg/g	0.1	ND



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HFC-134	359-35-3	µg/g	0.1	ND
HFC-134a	811-97-2	µg/g	0.1	ND
HFC-152a	75-37-6	µg/g	0.1	ND
HFC-143	420-46-2	µg/g	0.1	ND
HFC-143a	430-66-0	µg/g	0.1	ND
HFC-227ea	431-89-0	µg/g	0.1	ND
HFC-236 cb	677-56-5	µg/g	0.1	ND
HFC-236ea	431-63-0	µg/g	0.1	ND
HFC-236fa	690-39-1	µg/g	0.1	ND
HFC-245ca	679-86-7	µg/g	0.1	ND
HFC-245fa	460-73-1	µg/g	0.1	ND
HFC-365mfc	406-58-6	µg/g	0.1	ND
Perfluoromethane	75-73-0	µg/g	0.1	ND
Perfluoroethane	76-16-4	µg/g	0.1	ND
Perfluoropropane	76-19-7	µg/g	0.1	ND
Perfluorobutane	355-25-9	µg/g	0.1	ND
Perfluoropentane	678-26-2	µg/g	0.1	ND
Perfluorohexane	355-42-0	µg/g	0.1	ND
Perfluorocyclobutane	115-25-3	µg/g	0.1	ND
1,3-dichloropropane	142-28-9	µg/g	0.1	ND
2,2-dichloropropane	594-20-7	µg/g	0.1	ND
Carbon tetrachloride	56-23-5	µg/g	0.1	ND
chloroethane	75-00-3	µg/g	0.1	ND
Chloroform	67-66-3	µg/g	0.1	ND
chloromethane	74-87-3	µg/g	0.1	ND
Cis-1,2-dichloroethene	156-59-2	µg/g	0.1	ND
Cis-1,3-dichloropropene	10061-01-5	µg/g	0.1	ND
Hexachlorobutadiene	87-68-3	µg/g	0.1	ND
Methylene chloride	75-09-2	µg/g	0.1	ND
Tetrachloroethene	127-18-4	µg/g	0.1	ND
Trans-1,2-dichloroethene	156-60-5	µg/g	0.1	ND
Trans-1,3-dichloropropene	10061-02-6	µg/g	0.1	ND
Trichloroethylene	79-01-6	µg/g	0.1	ND
1,1,1,2-tetrachloroethane	630-20-6	µg/g	0.1	ND
1,1,1-trichloroethane	71-55-6	µg/g	0.1	ND
1,1,2,2-tetrachloroethane	79-34-5	µg/g	0.1	ND
1,1,2-trichloroethane	79-00-5	µg/g	0.1	ND
1,1-dichloroethane	75-34-3	µg/g	0.1	ND
1,1-dichloroethene	75-35-4	µg/g	0.1	ND
1,1-dichloropropene	563-58-6	µg/g	0.1	ND
1,2,3-trichloropropane	96-18-4	µg/g	0.1	ND
1,2-dichloroethane	107-06-2	µg/g	0.1	ND
1,2-dichloropropane	78-87-5	µg/g	0.1	ND
C ₃ F ₆ Cl ₂	1652-80-8	µg/g	0.1	ND
SF ₆	2551-62-4	µg/g	0.1	ND
HFC-161	353-36-6	µg/g	0.1	ND
HCFC-224	422-54-8	µg/g	0.1	ND



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Polychlorinated Biphenyls(PCBs)

Test Method: With reference to US EPA 3540C:1996, analysis was performed by GC-MS

Test Item(s)	CAS No.	Unit(s)	MDL	A1
2,4,4'-Trichlorobiphenyl(PCB28)	7012-37-5	mg/kg	0.5	ND
2,2',5,5'-Tetrachlorobiphenyl(PCB52)	35693-99-3	mg/kg	0.5	ND
2,2',4,5,5'-Pentachlorobiphenyl(PCB101)	37680-73-2	mg/kg	0.5	ND
2,3',4,4',5-Pentachlorobiphenyl(PCB118)	31508-00-6	mg/kg	0.5	ND
2,2',3,4,4',5'-Hexachlorobiphenyl(PCB138)	35065-28-2	mg/kg	0.5	ND
2,2',4,4',5,5'-Hexachlorobiphenyl(PCB153)	35065-27-1	mg/kg	0.5	ND
2,2',3,4,4',5,5'-Heptachlorobiphenyl(PCB180)	35065-29-3	mg/kg	0.5	ND

Polychlorinated Naphthalenes (PCNs)

Test Method: With reference to US EPA 3540C:1996, analysis was performed by GC-MS.

Test Item(s)	CAS No.	Unit(s)	MDL	A1
1-Chlorinated Naphthalene	90-13-1	mg/kg	5	ND
2-Chlorinated Naphthalene	91-58-7	mg/kg	5	ND
1,4-Dichlorinated Naphthalene	1825-31-6	mg/kg	5	ND
1,5-Dichlorinated Naphthalene	1825-30-5	mg/kg	5	ND
1,2-Dichlorinated Naphthalene	2050-69-3	mg/kg	5	ND
1,8-Dichlorinated Naphthalene	2050-74-0	mg/kg	5	ND
1,2,3-Trichlorinated Naphthalene	50402-52-3	mg/kg	5	ND
1,2,3,4-Tetrachlorinated Naphthalene	20020-02-4	mg/kg	5	ND
1,2,3,4,6-Pentachlorinated Naphthalene	67922-26-3	mg/kg	5	ND
Octa-Chlorinated Naphthalene	2234-13-1	mg/kg	5	ND

Polyvinyl chloride (PVC)

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

Test Item(s)	A1
Polyvinyl chloride (PVC)	Negative

Notes:

(1) Negative=Undetectable, Positive=Detectable

Radioactive element

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



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Test Item(s)	Unit(s)	MDL	A1
Cesium(Cs)	mg/kg	1	ND
Strontium(Sr)	mg/kg	1	ND
Uranium (U)	mg/kg	1	ND
Thorium(Th)	mg/kg	1	ND

Notes:

(1) No radioactivity is detected by geiger counter.

Solvent Residue

Test Method: With reference to US EPA 8260D:2018 & US EPA 5000:1996, analysis was performed by GC-MS.

Test Item(s)	CAS No.	Unit(s)	MDL	A1
1,4-dioxane	123-91-1	mg/kg	5	ND

TBBP-A

Test Method: With reference to US EPA 3540C:1996, analysis was performed by GC-MS/LC-MS.

Test Item(s)	CAS No.	Unit(s)	MDL	A1
TBBP-A	79-94-7	mg/kg	10	ND

VOC

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

Test Item(s)	Unit(s)	MDL	A1
Trichloroethylene	mg/kg	1	ND

Organic-tin compounds

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

Test Item(s)	Unit(s)	MDL	A1
Tributyl tin(TBT)	mg/kg	0.02	ND
Triphenyl tin(TPhT)	mg/kg	0.02	ND

Perfluorooctane Sulfonates (PFOS) and its derivatives and Perfluorooctanoic Acid (PFOA) and its salts

Test Method: With reference to CEN/TS 15968:2010, analysis was performed by HPLC-MS or LC-MS/MS.



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Test Item(s)	CAS No.	Unit(s)	MDL	A1
PFOS and its derivatives	-	mg/kg	-	ND
Perfluorooctane Sulfonates(PFOS)*	-	mg/kg	0.010	ND
N-ethylperfluoro-1-octanesulfonamide (N-EtFOSA)	4151-50-2	mg/kg	0.010	ND
N-methylperfluoro-1-octanesulfonamide (N-MeFOSA)	31506-32-8	mg/kg	0.010	ND
2-(N-ethylperfluoro-1-octanesulfonamido) -ethanol (N-EtFOSE)	1691-99-2	mg/kg	0.010	ND
2-(N-methylperfluoro-1-octanesulfonamido) -ethanol (N-MeFOSE)	24448-09-7	mg/kg	0.010	ND
Perfluorooctane Sulfonamide (PFOSA)	754-91-6	mg/kg	0.010	ND
Perfluorooctanoic Acid (PFOA) and its salts*	-	mg/kg	0.010	ND

Notes:

(1) Perfluorooctanoic acid (PFOA) and its salts* including PFOA (CAS No. 335-67-1), APFO (CAS No. 3825-26-1), PFOA-Na (CAS No. 335-95-5), PFOA-K (CAS No. 2395-00-8), PFOA-Ag (CAS No. 335-93-3) and PFOA-F (CAS No. 335-66-0). The result of PFOA is used to represent PFOA and its salts.

(2) Perfluorooctane sulfonates (PFOS) and its salts* including PFOS (CAS No. 1763-23-1), POSF(CAS No. 307-35-7), PFOS-K (CAS No. 2795-39-3), PFOS-NH₄ (CAS No. 29081-56-9), PFOS-N(C₁₀H₂₁)₂(CH₃)₂ (CAS No. 251099-16-8), PFOS-NH₂(C₂H₄OH)₂ (CAS No. 70225-14-8), PFOS-Li (CAS No. 29457-72-5), PFOS-N(C₂H₅)₄ (CAS No. 56773-42-3) and PFOS-Na (CAS No. 4021-47-0). The result of PFOS is used to represent PFOS and its salts.

Persistent, Bioaccumulative, and Toxic (PBT) Chemicals under US EPA Toxic Substances Control Act (TSCA) Section 6(h)

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

Test Item(s)	CAS No.	Limit	Unit(s)	MDL	A1
Decabromodiphenyl ether (DecaBDE) ^{Δ1}	1163-19-5	Prohibited	mg/kg	5	ND
Phenol, isopropylated phosphate (3:1) (PIP 3:1) ^{Δ2}	68937-41-7	Prohibited	mg/kg	5	ND
2,4,6-Tris(tert-butyl)phenol (2,4,6-TTBP) ^{Δ3}	732-26-3	3000	mg/kg	5	ND
Hexachlorobutadiene (HCBd)	87-68-3	Prohibited	mg/kg	5	ND
Pentachlorothiophenol (PCTP)	133-49-3	10000	mg/kg	5	ND
Conclusion					Pass

Notes:

(1) The regulation is available at the following link.

<https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/persistent-bioaccumulative-and-toxic-pbt-chemicals-under>



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(2) ^{Δ1}: The submitted sample is exempted if it is plastic for recycling from products or articles containing Deca-BDE.

(3) ^{Δ2}: The submitted sample is exempted from the regulated scope if it is anyone of the following:

- Hydraulic fluids for aviation or military industry;
- Lubricants and grease;
- New and replacement parts for motor and aerospace vehicles;
- Intermediate in a closed system to produce cyanoacrylate adhesive;
- Specialized engine air filters for locomotive and marine applications;
- Plastic for recycling from products or articles containing PIP (3:1);
- Finished products or articles made of plastic recycled from products or articles containing PIP (3:1).

(4) ^{Δ3}: The submitted sample is out of the regulated scope if it is not oil or lubricant.

Azo Dyes

Test Method: With reference to EN ISO 14362-1:2017, analysis was performed by GC-MS/HPLC-DAD.

Test Item(s)	CAS No.	Limit	Unit(s)	MDL	A1	
					Colorant Extraction *	Direct Reduction *
4-Aminobiphenyl	92-67-1	30	mg/kg	5	ND	ND
Benzidine	92-87-5	30	mg/kg	5	ND	ND
4-Chlor-o-toluidine	95-69-2	30	mg/kg	5	ND	ND
2-Naphthylamine	91-59-8	30	mg/kg	5	ND	ND
o-Aminoazotoluene	97-56-3	30	mg/kg	5	ND	ND
5-Nitro-o-Toluidine/2-Amino-4-Nitrotoluene	99-55-8	30	mg/kg	5	ND	ND
4-Chloroaniline	106-47-8	30	mg/kg	5	ND	ND
4-Methoxy-m-Phenylenediamine/2,4-Diaminoaniso	615-05-4	30	mg/kg	5	ND	ND
4,4'-Diaminodiphenylmethane, MDA	101-77-9	30	mg/kg	5	ND	ND
3,3'-Dichlorobenzidine	91-94-1	30	mg/kg	5	ND	ND
3,3'-Dimethoxybenzidine	119-90-4	30	mg/kg	5	ND	ND
3,3'-Dimethylbenzidine	119-93-7	30	mg/kg	5	ND	ND
4,4'-methylenedi-o-Toluidine/3,3'-Dimethyl-4,4'-Diaminodiphenylmethane	838-88-0	30	mg/kg	5	ND	ND
p-Cresidine	120-71-8	30	mg/kg	5	ND	ND
4,4'-Methylene-bis-(2-chloroaniline)	101-14-4	30	mg/kg	5	ND	ND
4,4'-Oxydianiline	101-80-4	30	mg/kg	5	ND	ND
4,4'-Thiodianiline	139-65-1	30	mg/kg	5	ND	ND
o-Toluidine	95-53-4	30	mg/kg	5	ND	ND
4-Methyl-m-Phenylenediamine/2,4-Toluylendiamine, TDA	95-80-7	30	mg/kg	5	ND	ND
2,4,5-Trimethylaniline	137-17-7	30	mg/kg	5	ND	ND
4-Aminoazobenzene	60-09-3	30	mg/kg	5	ND	ND
O-Anisidine	90-04-0	30	mg/kg	5	ND	ND



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Test Item(s)	CAS No.	Limit	Unit(s)	MDL	A1	
2,4-Xylidine	95-68-1	30	mg/kg	5	ND	ND
2,6-Xylidine	87-62-7	30	mg/kg	5	ND	ND
Conclusion					Pass	Pass

Notes:

(1) *Direct reduction refers to the extraction and reduction according to EN ISO 14362-1:2017 clause 10.2 and relevant clauses.

*Colorant extraction refers to the colourant extraction and subsequent reduction according to EN ISO 14362-1:2017 Clause 10.1 and relevant clauses.

(2) 4-Aminodiphenyl (CAS No. 92-67-1), 2-Naphthylamine (CAS No. 91-59-8) and 2,4-Diaminoanisole (CAS No. 615-05-4) can be indirectly generated from some colorants which do not contain these amines azo bound. The use of banned azo colorants cannot be reliably ascertained without additional information.

(3) In case PU is used, e.g. PU Foams or coatings, it cannot be ruled out that MDA (CAS No. 101-77-9) and TDA (CAS No. 95-80-7) can be released from PU material, not from banned azo colorant. Similarly, for pigment prints, MDA will be released from a chemical fixing agent.

(4) EN ISO 14362-1:2017 will enable further cleavage of 4-AAB (CAS No. 60-09-3) to non-forbidden amines: aniline and p-phenylenediamine. If aniline and/or p-phenylenediamine is not found, 4-AAB is considered as "n.d." (i.e. <5.0 mg/kg). Otherwise, EN ISO 14362-3:2017 will be employed to verify the presence of 4-AAB.

(5) Limit = 30 mg/kg (each)

(6) The maximum permissible limit is quoted from the client requirement.

(7) These tests were subcontracted to SGS Changzhou Chemical lab .

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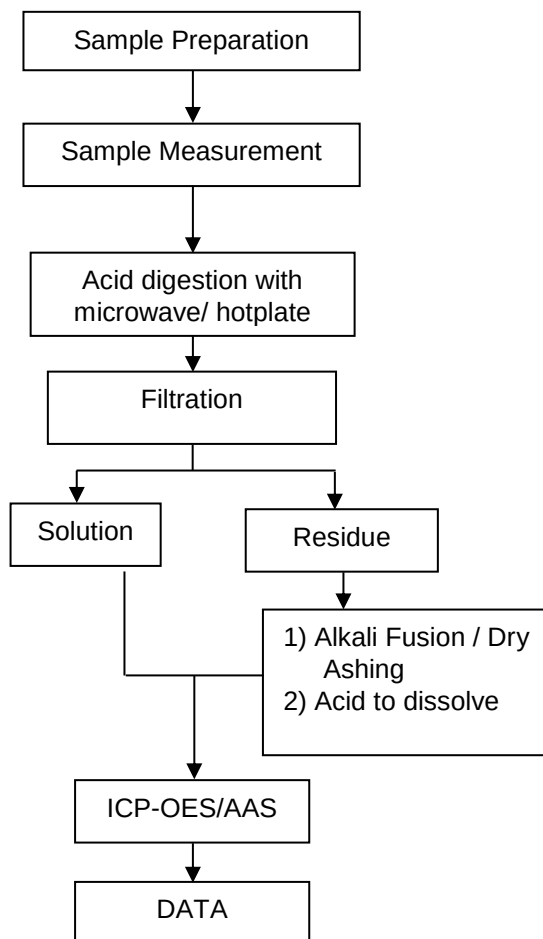
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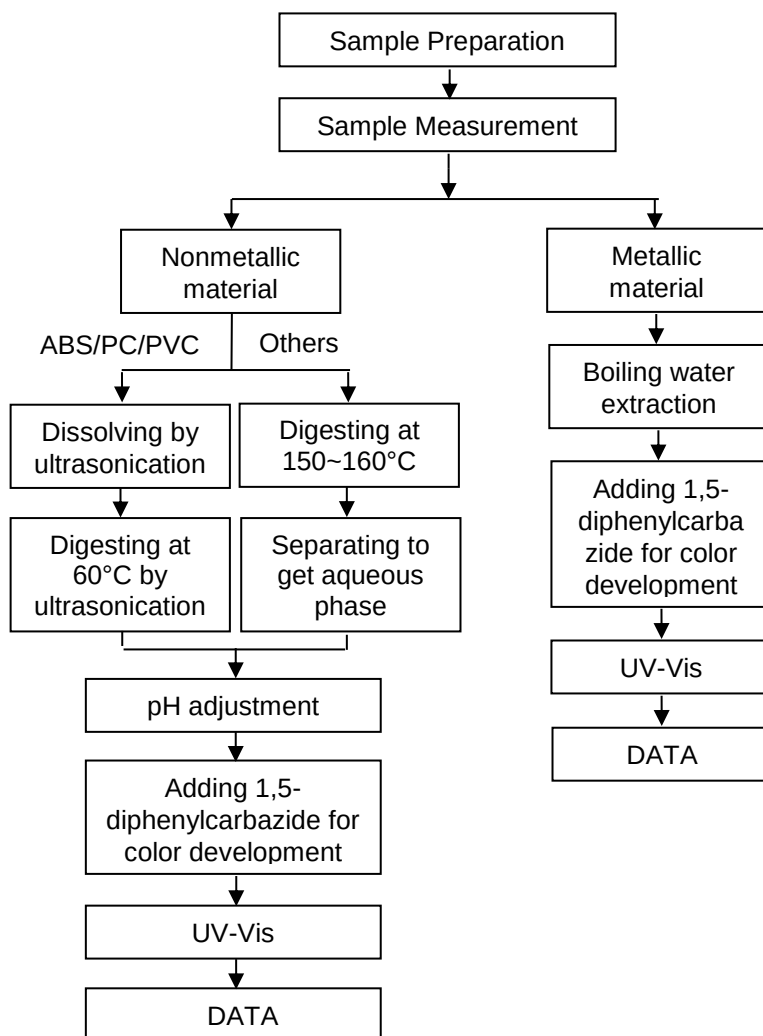
Elements Testing Flow Chart

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



ATTACHMENTS

Hexavalent Chromium (Cr(VI)) Testing Flow Chart



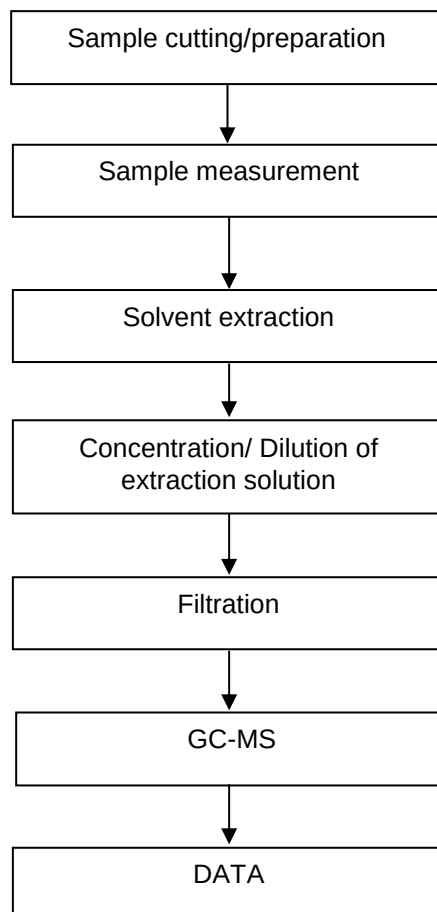
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PBBs/PBDEs Testing Flow Chart



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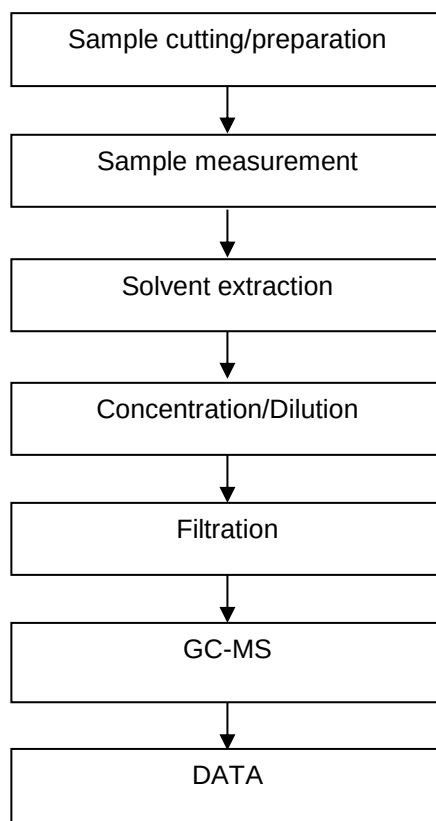
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Phthalates Testing Flow Chart



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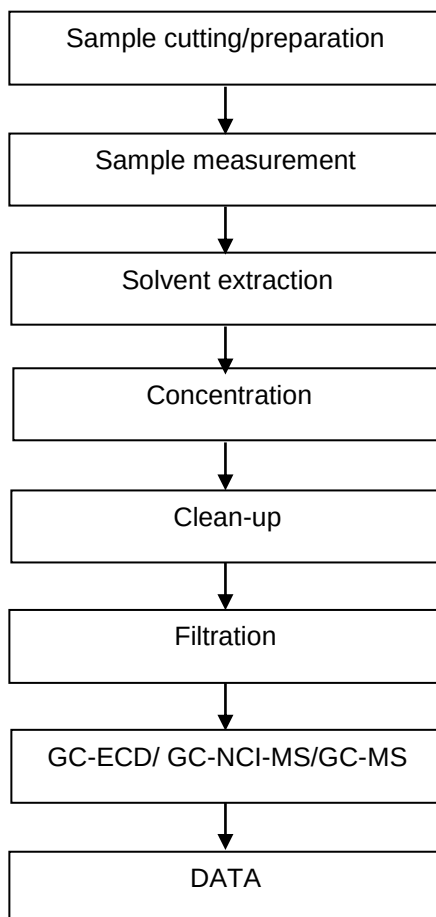
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Chlorinated Paraffin Testing Flow Chart



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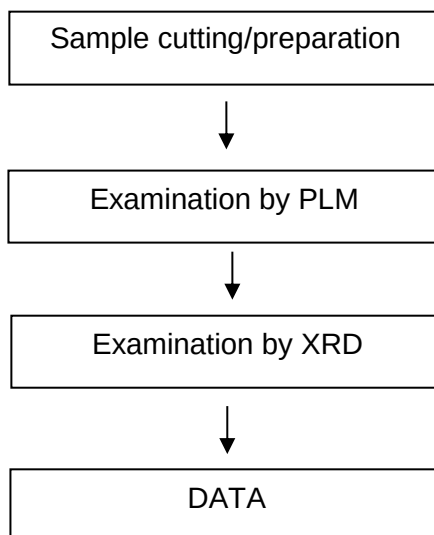
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Asbestos Testing Flow Chart



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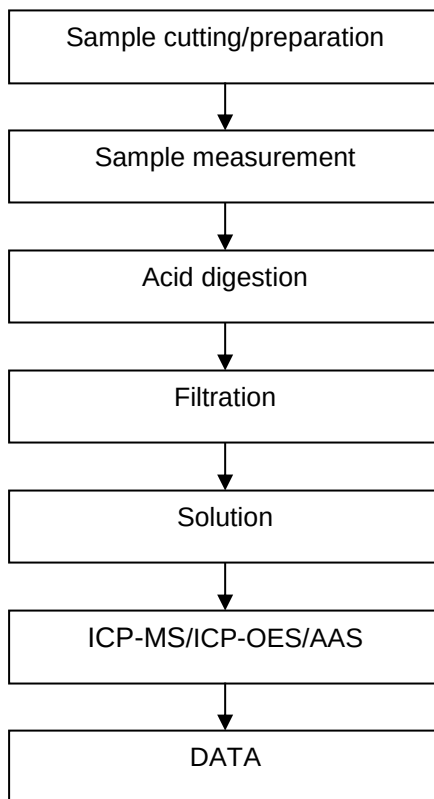
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Elements Testing Flow Chart



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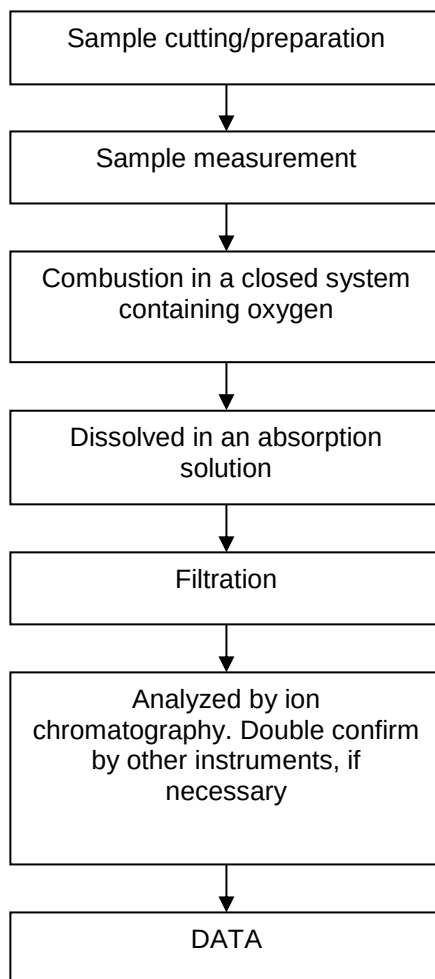
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Halogen Testing Flow Chart



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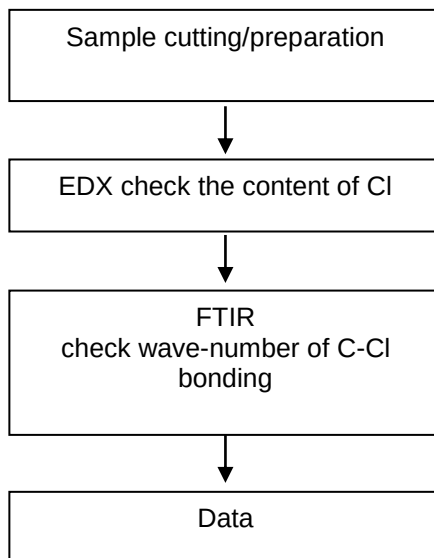
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PVC Testing Flow Chart



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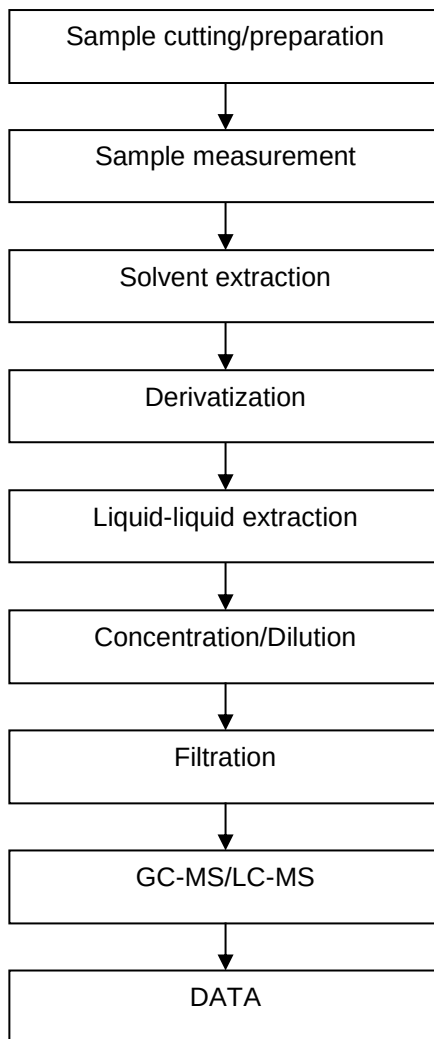
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TBBP-A Testing Flow Chart



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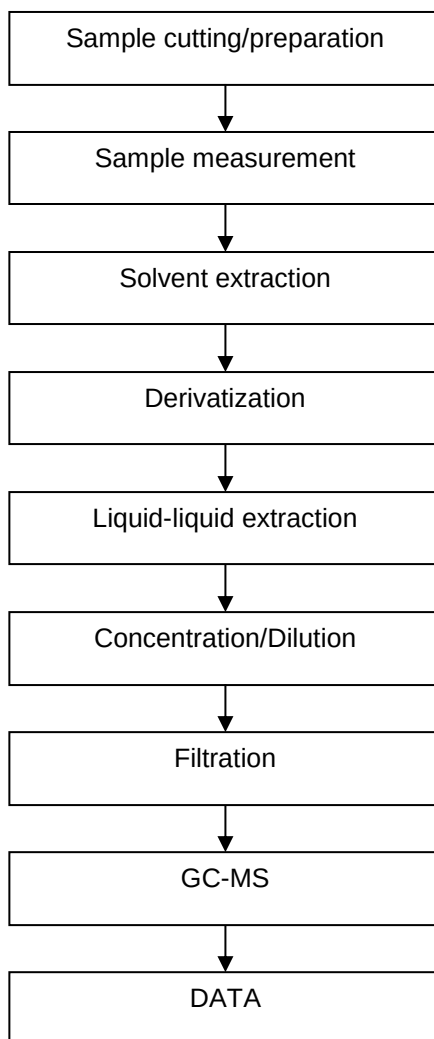
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Organotin Testing Flow Chart



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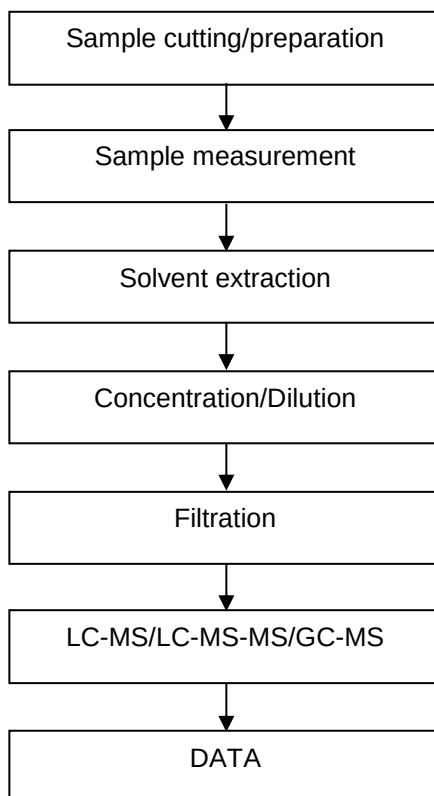
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PFASs/ PFOS/PFOA Testing Flow Chart



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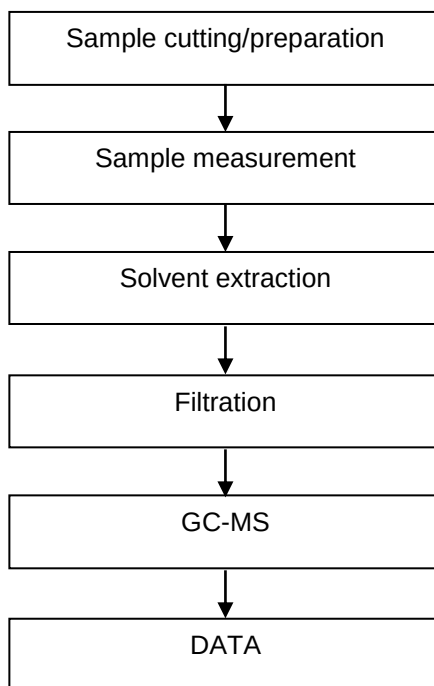
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Persistent, Bioaccumulative, and Toxic (PBT) Chemicals Testing Flow Chart



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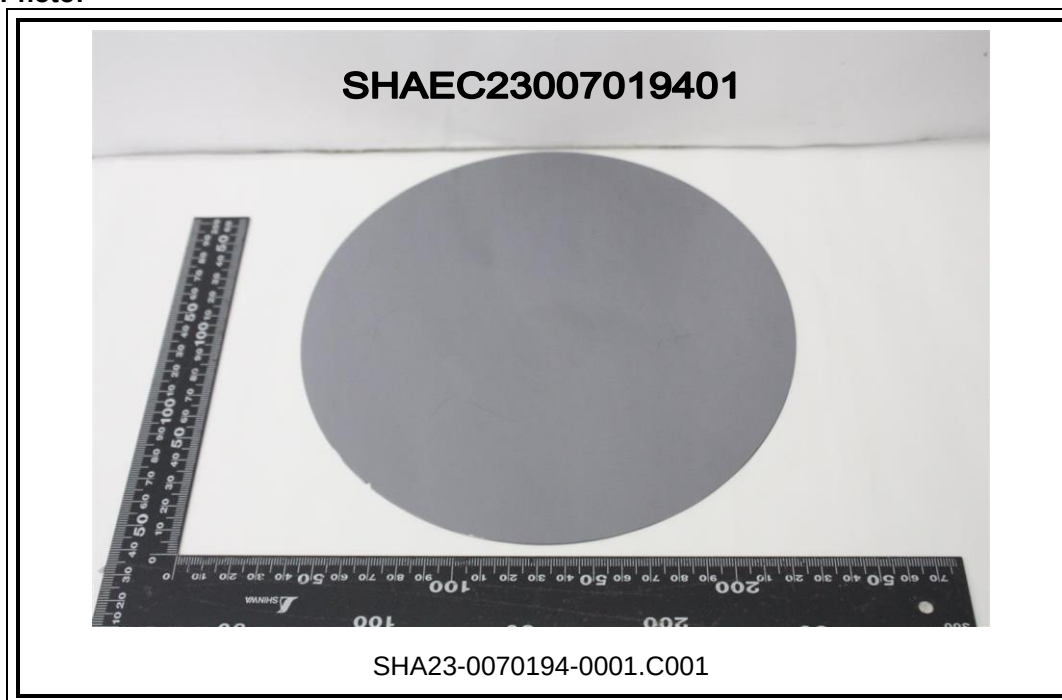
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