Test Report

No.: ETR22C00008 Date: 20-Dec-2022

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

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

Sample Submitted By : TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
Sample Name : TSMC FAB 14A FINISHED WAFER

==========

Sample Receiving Date : 01-Dec-2022
Testing Period : 01-Dec-2022 to 20-Dec-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) As specified by client, the sample(s) was/were tested for 5 PBTs with reference to Regulation of Persistent, Bioaccumulative, Toxic (PBT) Chemicals under Toxic Substances Control Act (TSCA) Section 6(h). Please refer to result table for testing item(s).

(3) 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.

(2) Based on the performed tests on submitted sample(s), the test result(s) comply with the limits as set by Persistent, Bioaccumulative, Toxic (PBT) Chemicals under Toxic Substances Control Act (TSCA) Section 6(h).

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

PIN CODE: D4A15901

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

Test Part Description

No.1 : WAFER

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)		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

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

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)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Di-(2-ethylhexyl) phthalate (DEHP) (CAS No.: 117-81-7)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Diisobutyl phthalate (DIBP) (CAS No.: 84-69-5)	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.	-
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.	-
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)	With reference to BS EN 14582: 2016, analysis was performed by IC.	mg/kg	50	n.d.	-
Bromine (Br) (CAS No.: 10097-32-2)	With reference to BS EN 14582: 2016, analysis was performed by IC.	mg/kg	50	n.d.	-
Iodine (I) (CAS No.: 14362-44-8)	With reference to BS EN 14582: 2016, analysis was performed by IC.	mg/kg	50	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 terphenyls (PCTs)	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.	-

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Short Chain Chlorinated Paraffins(C10-C13) (SCCP) (CAS No.: 85535-84-8)	With reference to ISO 18219-1: 2021, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Triphenyl tin (TPT)	With reference to ISO 17353: 2004, analysis was performed by GC/FPD.	mg/kg	0.03	n.d.	-
Tributyl tin (TBT)	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.	-
Dibutyl tin (DBT)	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.	-
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).	-	-	Negative	-
Amosite (CAS No.: 12172-73-5)		-	-	Negative	-
Anthophyllite (CAS No.: 77536-67-5)		-	-	Negative	-
Chrysotile (CAS No.: 12001-29-5)		-	-	Negative	-
Crocidolite (CAS No.: 12001-28-4)		-	-	Negative	-
Tremolite (CAS No.: 77536-68-6)		-	-	Negative	-
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.	-
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.	-

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
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.	-
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.	-

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
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.	-
Chlorofluorocarbons (CFCs)					
CFC-13 (CAS No.: 75-72-9)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
CFC-111 (CAS No.: 354-56-3)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
CFC-112 (CAS No.: 76-12-0)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
CFC-211 (CAS No.: 422-78-6)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
CFC-212 (CAS No.: 3182-26-1)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
CFC-213 (CAS No.: 2354-06-5)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
CFC-214 (CAS No.: 29255-31-0)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
CFC-215 (CAS No.: 4259-43-2)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
CFC-216 (CAS No.: 661-97-2)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
CFC-217 (CAS No.: 422-86-6)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
CFC-12 (CAS No.: 75-71-8)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
CFC-11 (CAS No.: 75-69-4)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
CFC-115 (CAS No.: 76-15-3)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
CFC-114 (CAS No.: 76-14-2)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
CFC-113 (CAS No.: 76-13-1)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Hydrochlorofluorocarbons (HCFCs)					
HCFC-21 (CAS No.: 75-43-4)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-22 (CAS No.: 75-45-6)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-31 (CAS No.: 593-70-4)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-121 (CAS No.: 354-14-3)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
HCFC-122 (CAS No.: 354-21-2)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-123 (CAS No.: 306-83-2)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-124 (CAS No.: 2837-89-0)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-131 (CAS No.: 359-28-4)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-132b (CAS No.: 1649-08-7)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-133a (CAS No.: 75-88-7)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-142b (CAS No.: 75-68-3)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-221 (CAS No.: 422-26-4)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-222 (CAS No.: 422-49-1)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-223 (CAS No.: 422-52-6)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-224 (CAS No.: 422-54-8)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-225ca (CAS No.: 422-56-0)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-225cb (CAS No.: 507-55-1)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-226 (CAS No.: 431-87-8)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-231 (CAS No.: 421-94-3)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-232 (CAS No.: 460-89-9)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-233 (CAS No.: 7125-84-0)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
HCFC-234 (CAS No.: 425-94-5)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-235 (CAS No.: 460-92-4)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-241 (CAS No.: 666-27-3)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-242 (CAS No.: 460-63-9)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-244	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-251 (CAS No.: 421-41-0)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-252 (CAS No.: 819-00-1)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-261 (CAS No.: 420-97-3)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-262 (CAS No.: 421-02-03)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-271 (CAS No.: 430-55-7)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-141b (CAS No.: 1717-00-6)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-243 (CAS No.: 460-69-5)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-253 (CAS No.: 460-35-5)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-141	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-142	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-151	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-225	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

Test Item(s)	Method	Unit	MDL	Result No.1	Limit
Halons					
Halon-1211 (CAS No.: 353-59-3)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Halon-1301 (CAS No.: 75-63-8)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Halon-2402 (CAS No.: 124-73-2)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Methyl Bromide (CAS No.: 74-83-9)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Hydrobromofluorocarbons (HBFCs)					
HBFC-271B1 (C3H6FBr)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-262B1 (C3H5F2Br)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-261B2 (C3H5FBr2)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-253B1 (C3H4F3Br)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-252B2 (C3H4F2Br2)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-251B3 (C3H4FBr3)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-244B1 (C3H3F4Br)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-243B2 (C3H3F3Br2)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-242B3 (C3H3F2Br3)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-241B4 (C3H3FBr4)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-235B1 (C3H2F5Br)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-234B2 (C3H2F4Br2)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
HBFC-233B3 (C3H2F3Br3)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-232B4 (C3H2F2Br4)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-231B5 (C3H2FBr5)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-226B1 (C3HF6Br)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-225B2 (C3HF5Br2)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-224B3 (C3HF4Br3)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-223B4 (C3HF3Br4)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-222B5 (C3HF2Br5)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-221B6 (C3HFBr6)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-151B1 (C2H4FBr)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-142B1 (C2H3F2Br)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-141B2 (C2H3FBr2)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-133B1 (C2H2F3Br)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-132B2 (C2H2F2Br2)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-131B3 (C2H2FBr3)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-124B1 (C2HF4Br)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-123B2 (C2HF3Br2)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
HBFC-122B3 (C2HF2Br3)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-121B4 (C2HFBr4)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-31B1 (CH2FBr) (CAS No.: 373-52-4)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-22B1 (CHF2Br) (CAS No.: 1511-62-2)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-21B2 (CHFBr2) (CAS No.: 1868-53-7)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Hydrofluorocarbon (HFCs)					
HFC-23 (CHF3) (CAS No.: 75-46-7)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HFC-32 (CH2F2) (CAS No.: 75-10-5)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HFC-41 (CH3F) (CAS No.: 593-53-3)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HFC-43-10mee (C5H2F10)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HFC-125 (C2HF5)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HFC-134 (C2H2F4)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HFC-134a (CH2FCF3) (CAS No.: 811-97-2)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HFC-143 (CH3F3)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HFC-143a (CH3F3)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HFC-152a (C2H4F2) (CAS No.: 75-37-6)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HFC-227ea (C3HF7) (CAS No.: 431-89-0)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
HFC-236fa (CAS No.: 431-63-0)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HFC-245ca (C3H3F5)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HFC-245fa (C3H3F5)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HFC-365mfc (C4H5F5)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HFC-236ea (C3H2F6) (CAS No.: 431-63-0)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Perfluorocarbon (PFCs)					
1,4-dihydrooctafluorobutane (CAS No.: 377-36-6)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
2-Perfluoromethylpentane (CAS No.: 355-04-4)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Decafluorobutane (CAS No.: 355-25-9)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
F14 (CAS No.: 75-73-0)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Fluorocarbon 116 (CAS No.: 76-16-4)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Freon 218 (CAS No.: 76-19-7)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Freon C318 (CAS No.: 115-25-3)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Nonafluor-2- (trifluoromethyl)butane (CAS No.: 594-91-2)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Perfluorisobutene (CAS No.: 382-21-8)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Perfluorohexane (CAS No.: 355-42-0)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Perfluoro-n-pentane (CAS No.: 678-26-2)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Perfluor-1-butene (CAS No.: 357-26-6)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Chlorinate hydrocarbon (CHCs)					
1,1-Dichloropropene (CAS No.: 563-58-6)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
1,2-Dichloroethane (CAS No.: 107-06-2)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
2,2-Dichloropropane (CAS No.: 594-20-7)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Carbon tetrachloride (CAS No.: 56-23-5)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Chloromethane (CAS No.: 74-87-3)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
cis-1,2-Dichloroethene (CAS No.: 156-59-2)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
cis-1,3-Dichloropropene (CAS No.: 10061-01-5)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Hexachlorobutadiene (CAS No.: 87-68-3)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
trans-1,2-Dichloroethene (CAS No.: 156-60-5)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
trans-1,3-Dichloropropene (CAS No.: 10061-02-6)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Dichloromethane, Methylene chloride (CAS No.: 75-09-2)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
1,2-Dichloropropane (CAS No.: 78-87-5)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
1,1,1,2-Tetrachloroethane (CAS No.: 630-20-6)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
1,1,1-Trichloroethane (CAS No.: 71-55-6)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
1,1,2-Trichloroethane (CAS No.: 79-00-5)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
1,1,2,2-Tetrachloroethane (CAS No.: 79-34-5)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
1,1-Dichloroethylene (CAS No.: 75-35-4)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
1,1-Dichloroethane (CAS No.: 75-34-3)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Chloroethane (CAS No.: 75-00-3)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Tetrachloroethene (CAS No.: 127-18-4)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Trichloroethylene (CAS No.: 79-01-6)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
1,3-Dichloropropane (CAS No.: 142-28-9)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Chloroform (CAS No.: 67-66-3)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
1,2,3-Trichloropropane (CAS No.: 96-18-4)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Bromochloromethan (CAS No.: 74-97-5)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Sulfur hexafluoride (CAS No.: 2551-62-4)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Decabromodiphenyl ether (DecaBDE) (CAS No.: 1163-19-5)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	5	n.d.	Prohibited / N/A(*3)
Phenol, isopropylated, phosphate (3:1) (PIP 3:1) (CAS No.: 68937-41-7)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	5	n.d.	Prohibited / N/A(*1)
2,4,6-Tris(tert-butyl)phenol (2,4,6-TTBP) (CAS No.: 732-26-3)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	5	n.d.	3000 / N/A(*2)
Pentachlorothiophenol (PCTP) (CAS No.: 133-49-3)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	5	n.d.	10000
Hexachlorobutadiene (HCBD) (CAS No.: 87-68-3)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	5	n.d.	Prohibited
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.	-

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
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.	-
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.	-
Perfluorobutane Acid (PFBA) (CAS No.: 375-22-4)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorobutane Sulfonate (PFBS) (CAS No.: 375-73-5)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorobutane Sulfonate K-salt (PFBS-K) (CAS No.: 29420-49-3)	Calculated from the result of PFBS.	mg/kg	0.01▲	n.d.	-
Perfluorobutane sulfonyl fluoride (PFBS-F) (CAS No.: 375-72-4)	Calculated from the result of PFBS.	mg/kg	0.01▲	n.d.	-
Tetraethylammonium perfluorobutanesulfonate (PFBS-N(CH3CH2)4) (CAS No.: 25628-08-4)	Calculated from the result of PFBS.	mg/kg	0.01▲	n.d.	-
Perfluoropentane Acid (PFPA) (CAS No.: 2706-90-3)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorohexane Acid (PFHxA) (CAS No.: 307-24-4)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Ammonium perfluorohexanoate (PFHxA-NH4) (CAS No.: 21615-47-4)	Calculated from the result of PFHxA.	mg/kg	0.01▲	n.d.	-
Perfluorohexyl iodide (PFHxI) (CAS No.: 355-43-1)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Perfluorohexyl ethylene (PFHxE) (CAS No.: 25291-17-2)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
1H,1H,2H,2H-Perfluorooctyl iodide (6_2FOI) (CAS No.: 2043-57-4)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-Perfluoro-1-octanol (6:2FTOH) (CAS No.: 647-42-7)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-Perfluorooctylacrylate (6:2FTA) (CAS No.: 17527-29-6)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-perfluorooctyl methacrylate (6_2 FTMAC) (CAS No.: 2144-53-8)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
1H,1H,2H,2H-Perfluorooctanesulphonic Acid (H4PFOS 6:2) (CAS No.: 27619-97-2)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorohexane-1-sulphonic acid and its salts (PFHxS) (CAS No.: 355-46-4)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorohexanesulfonate NA-salt (PFHxS-Na) (CAS No.: 82382-12-5)	Calculated from the result of PFHxS.	mg/kg	0.01▲	n.d.	-
Perfluorohexanesulfonate K-salt (PFHxS-K) (CAS No.: 3871-99-6)	Calculated from the result of PFHxS.	mg/kg	0.01▲	n.d.	-
Perfluorohexanesulfonate ammonium salt (PFHxS-NH4) (CAS No.: 68259-08-5)	Calculated from the result of PFHxS.	mg/kg	0.01▲	n.d.	-
Perfluorohexanesulfonate Li-salt (PFHxS-Li) (CAS No.: 55120-77-9)	Calculated from the result of PFHxS.	mg/kg	0.01▲	n.d.	-
Perfluorohexanesulfonate Zn-salt (PFHxS-Zn) (CAS No.: 70136-72-0)	Calculated from the result of PFHxS.	mg/kg	0.01▲	n.d.	-
Perfluorohexanesulfonate sulfonyl fluoride (PFHxS-F) (CAS No.: 423-50-7)	Calculated from the result of PFHxS.	mg/kg	0.01▲	n.d.	-
Perfluoroheptane Acid (PFHpA) (CAS No.: 375-85-9)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
7H-Dodecanefluoroheptane Acid (HPFHpA) (CAS No.: 1546-95-8)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluoroheptane Sulfonate (PFHpS) (CAS No.: 375-92-8)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluoroheptanesulfonate Na-salt (PFHpS-Na) (CAS No.: 68555-66-8)	Calculated from the result of PFHpS.	mg/kg	0.01▲	n.d.	-
Perfluorooctane sulfonates (PFOS) (CAS No.: 1763-23-1)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Potassium Perfluorooctanesulfonate (PFOS-K) (CAS No.: 2795-39-3)	Calculated from the result of PFOS.	mg/kg	0.01▲	n.d.	-
Perfluorooctanesulfonic acid, lithium salt (PFOS-Li) (CAS No.: 29457-72-5)	Calculated from the result of PFOS.	mg/kg	0.01▲	n.d.	-
Perfluorooctanesulfonic acid, ammonium salt (PFOS-NH4) (CAS No.: 29081-56-9)	Calculated from the result of PFOS.	mg/kg	0.01▲	n.d.	-

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Perfluorooctane sulfonate diethanolamine salt (PFOS-NH(OH)2) (CAS No.: 70225-14-8)	Calculated from the result of PFOS.	mg/kg	0.01▲	n.d.	-
Perfluorooctanesulfonic acid,tetraethylammonium salt (PFOS-N(C2H5)4) (CAS No.: 56773-42-3)	Calculated from the result of PFOS.	mg/kg	0.01▲	n.d.	-
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) (CAS No.: 251099-16-8)	Calculated from the result of PFOS.	mg/kg	0.01▲	n.d.	-
Perfluorooctane sulfonyl fluoride (POSF) (CAS No.: 307-35-7)	Calculated from the result of PFOS.	mg/kg	0.01▲	n.d.	-
Perfluorooctanesulfonic acid, magnesium salt (PFOS-Mg) (CAS No.: 91036-71-4)	Calculated from the result of PFOS.	mg/kg	0.01▲	n.d.	-
Perfluorooctanesulfonic acid, sodium salt (PFOS-Na) (CAS No.: 4021-47-0)	Calculated from the result of PFOS.	mg/kg	0.01▲	n.d.	-
N-ethylperfluoro-1-octanesulfonamide (EtFOSA) (CAS No.: 4151-50-2)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
N-Methyl-Perfluoroctanesulfonamide (N-Me-FOSA) (CAS No.: 31506-32-8)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
N-Ethyl-Perfluoroctanesulfonamidoethanol (N-Et-FOSE alcohol) (CAS No.: 1691-99-2)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
N-Methyl-Perfluoroctanesulfonamidoethanol (N-Me-FOSE alcohol) (CAS No.: 24448-09-7)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluoroctanesulfonamide (PFOSA) (CAS No.: 754-91-6)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorooctanoic Acid (PFOA) (CAS No.: 335-67-1)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Sodium perfluorooctanoate (PFOA-Na) (CAS No.: 335-95-5)	Calculated from the result of PFOA.	mg/kg	0.01▲	n.d.	-
Potassium perfluorooctanoate (PFOA-K) (CAS No.: 2395-00-8)	Calculated from the result of PFOA.	mg/kg	0.01▲	n.d.	-

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Silver perfluorooctanote (PFOA-Ag) (CAS No.: 335-93-3)	Calculated from the result of PFOA.	mg/kg	0.01▲	n.d.	-
Perfluorooctanoyl fluoride (PFOA-F) (CAS No.: 335-66-0)	Calculated from the result of PFOA.	mg/kg	0.01▲	n.d.	-
Ammonium pentadecafluorooctanoate (APFO) (CAS No.: 3825-26-1)	Calculated from the result of PFOA.	mg/kg	0.01▲	n.d.	-
1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS) (CAS No.: 39108-34-4)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Methyl perfluorooctanoate (Me-PFOA) (CAS No.: 376-27-2)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
Ethyl perfluorooctanoate (Et-PFOA) (CAS No.: 3108-24-5)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-Perfluoro-1-decanol (8:2 FTOH) (CAS No.: 678-39-7)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-Perfluorodecyl acrylate (8:2 FTA) (CAS No.: 27905-45-9)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-Perfluorodecyl methacrylate (8:2 FTMA) (CAS No.: 1996-88-9)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
Perfluoro-1-iodooctane (PFOI) (CAS No.: 507-63-1)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
Perfluorononan-1-oic acid (PFNA) (CAS No.: 375-95-1)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorononanoate NA-Salt (PFNA-Na) (CAS No.: 21049-39-8)	Calculated from the result of PFNA.	mg/kg	0.01▲	n.d.	-
Perfluorononanoate ammounium salt (APFN) (CAS No.: 4149-60-4)	Calculated from the result of PFNA.	mg/kg	0.01▲	n.d.	-
Perfluoro-3,7-dimethyloctanoic Acid (PF-3,7-DMOA) (CAS No.: 172155-07-6)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Nonadecafluorodecanoic acid (PFDA) (CAS No.: 335-76-2)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorodecanoate Na-salt (PFDA-Na) (CAS No.: 3830-45-3)	Calculated from the result of PFDA.	mg/kg	0.01▲	n.d.	-

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Perfluorodecanoate ammonium salt (APFDA) (CAS No.: 3108-42-7)	Calculated from the result of PFDA.	mg/kg	0.01▲	n.d.	-
Henicosafluoroundecanoic acid (PFUnDA) (CAS No.: 2058-94-8)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Tricosafluorododecanoic acid (PFDoDA) (CAS No.: 307-55-1)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Ammonium Perfluorododecanoate (APFDoDA) (CAS No.: 3793-74-6)	Calculated from the result of PFDoDA.	mg/kg	0.01▲	n.d.	-
Perfluorodecane Sulfonate (PFDS) (CAS No.: 126105-34-8/ 335-77-3)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorodecanesulfonate Na-salt (PFDS-Na) (CAS No.: 2806-15-7)	Calculated from the result of PFDS.	mg/kg	0.01▲	n.d.	-
Perfluorodecanesulfonate K-salt (PFDS-K) (CAS No.: 2806-16-8)	Calculated from the result of PFDS.	mg/kg	0.01▲	n.d.	-
Perfluoroaliphatic Dean-sulfonate salt of NH4 (PFDS-NH4) (CAS No.: 67906-42-7)	Calculated from the result of PFDS.	mg/kg	0.01▲	n.d.	-
Pentacosafluorotridecanoic acid (PFTrDA) (CAS No.: 72629-94-8)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Heptacosafluorotetradecanoic acid (PFTDA) (CAS No.: 376-06-7)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Pentadecanoic acid, nonacosafluoro (PFPeDA,C15) (CAS No.: 141074-63-7)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Hexadecanoic acid, hentriacontafluoro (PFHxDA,C16) (CAS No.: 67905-19-5)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Octadecanoic acid, pentatriacontafluoro (PFODA,C18) (CAS No.: 16517-11-6)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
1H,1H,2H,2H-Perfluorododecylacrylate (10:2FTA) (CAS No.: 17741-60-5)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-Perfluoro-1-dodecanol (10:2FTOH) (CAS No.: 865-86-1)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
2H,2H-Perfluorodecane Acid (H2PFDA) (CAS No.: 27854-31-5;882489-14-7)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
2H,2H,3H,3H-Perfluoroundecanoic Acid (4HPFUnA) (CAS No.: 34598-33-9)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
1H,1H,2H,2H-Perfluoro-1-hexanol (4:2FTOH) (CAS No.: 2043-47-2)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-Perfluorodecyl iodide (8_2 FTI) (CAS No.: 2043-53-0)	With reference to CEN/TS 15968: 2010, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
2,3,3,3-Tetrafluoro-2-(heptafluoropropoxy)propionic acide (HFPO-DA) (CAS No.: 13252-13-6)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2 FTS) (CAS No.: 757124-72-4)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorooctane sulfonamidoacetic acid (FOSAA) (CAS No.: 2806-24-8)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
N-methylperfluorooctane sulfonamidoacetic acid (N-MeFOSAA) (CAS No.: 2355-31-9)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
N-ethylperfluorooctane sulfonamidoacetic acid (N-EtFOSAA) (CAS No.: 2991-50-6)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluoropentane sulfonic acid (PFPeS) (CAS No.: 2706-91-4)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
2-Perfluorohexyl ethanoic acid (6:2 FTCA) (CAS No.: 53826-12-3)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
3-Perfluoropentyl propanoic acid (5:3 FTCA) (CAS No.: 914637-49-3)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorononane sulfonic acid (PFNS) (CAS No.: 68259-12-1)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluoroundecane sulfonic acid (PFUnS) (CAS No.: 749786-16-1)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorododecane sulfonic acid (PFDoDS) (CAS No.: 79780-39-5)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Bis(1H,1H,2H,2H-Perfluorodecyl)phosphate (8_2diPAP) (CAS No.: 678-41-1)	With reference to CEN/TS 15968: 2010, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

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. 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".
6. ▲ : The MDL was evaluated for element / tested substance.
   Conversion Formula：AX = A × F

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

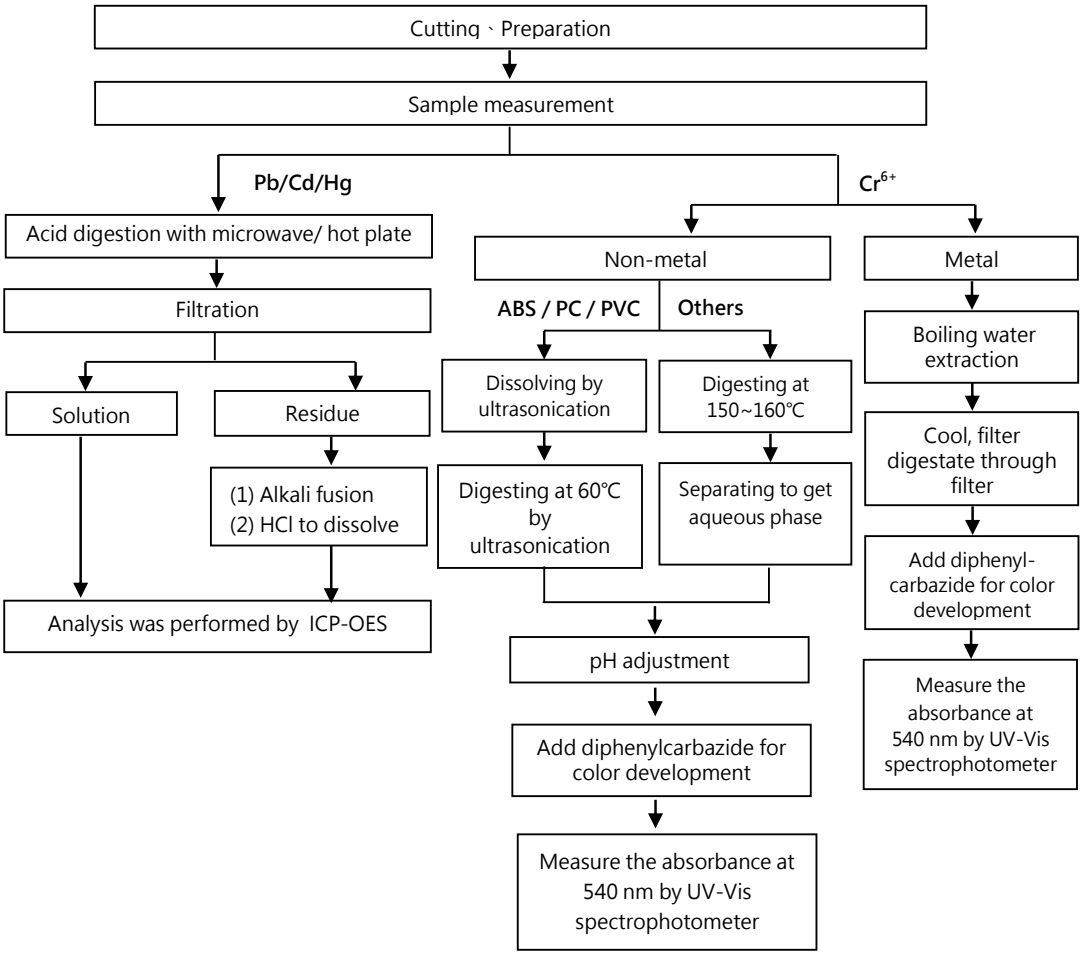
   Parameter Conversion Table： https://eecloud.sgs.com/Region_TW/DocDownload.aspx?name=Others
7. Unless otherwise stated , the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule (w=0) stated in ILAC-G8:09/2019. According to this rule, the judgement of conformity is based on the comparing test results with limits.
8. Detail explanation of 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
9. N/A(*1) : The submitted sample is exempted from the regulated scope if it is anyone of the following :
   - Hydraulic fluids for aviation or military
   - Lubricants and grease
   - New and replacement parts for motor and aerospace vehicles
   - Manufacture of cyanoacrylate adhesives in closed systems
   - Specialized engine air filters for locomotive and marine applications
   - Plastic for recycling from PIP (3:1)-containing products or articles
   - Finished products or articles made of plastic recycled from PIP (3:1)-containing products or articles
   - Processing and distribution in commerce of PIP (3:1)-containing articles, before October 31, 2024
10. N/A(*2) : The submitted sample is exempted from the regulated scope if it is not oil and lubricant additives.
11. N/A(*3) : The submitted sample is exempted from the regulated scope if it is anyone of the following :
    Exempts processing and distribution for recycling of DecaBDE-containing plastic from products or articles and DecaBDE-containing products or articles made from such recycled plastic.

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

Analytical flow chart of heavy metal

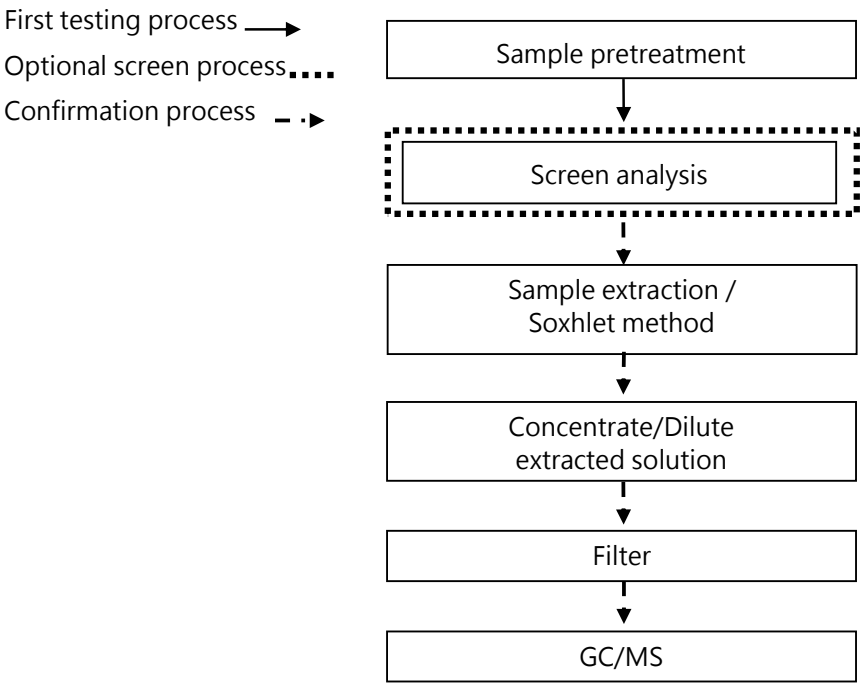
These samples were dissolved totally by pre-conditioning method according to below flow chart.

(Cr^{6+} test method excluded)



TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

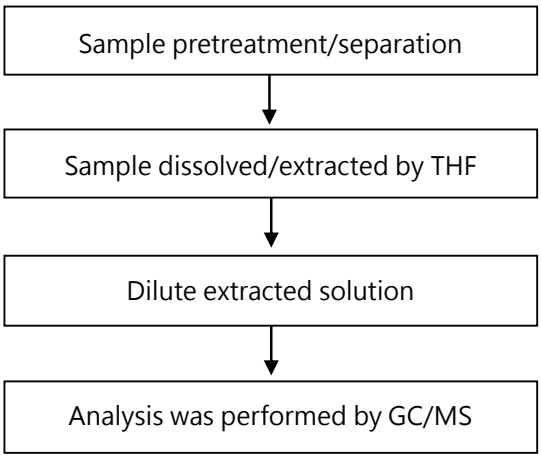
Analytical flow chart – PBBs / PBDEs



TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

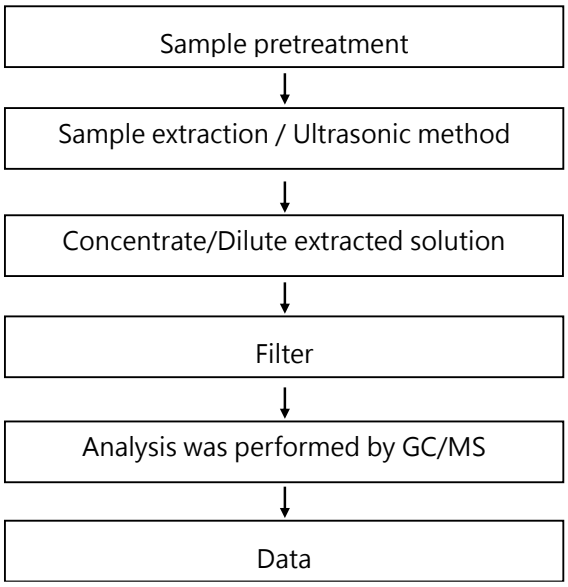
Analytical flow chart - Phthalate

【Test method: IEC 62321-8】



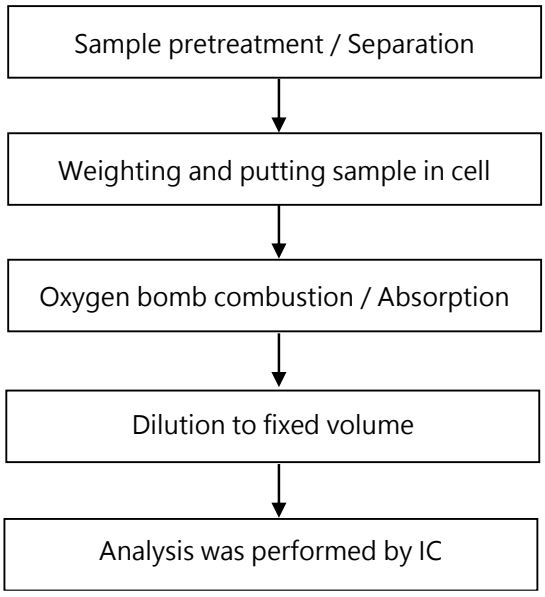
TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

Analytical flow chart - HBCDD



TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

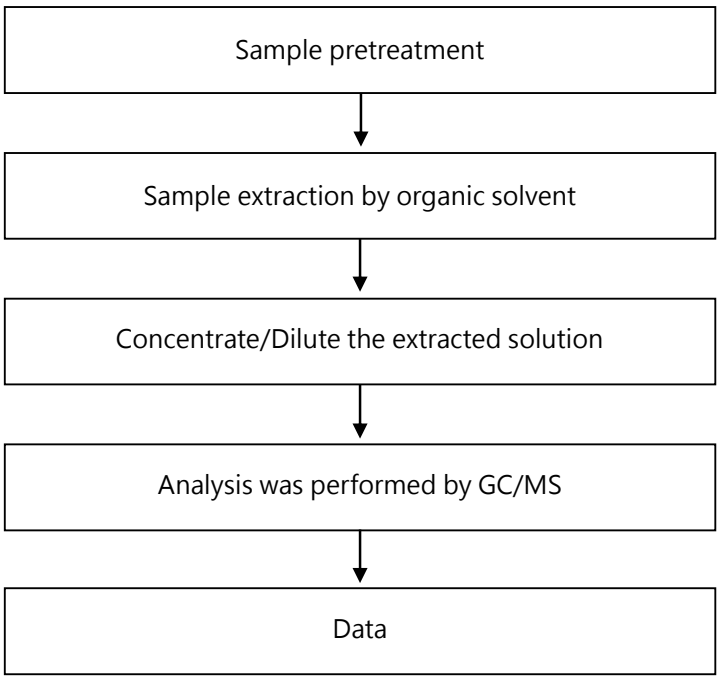
Analytical flow chart - Halogen



TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

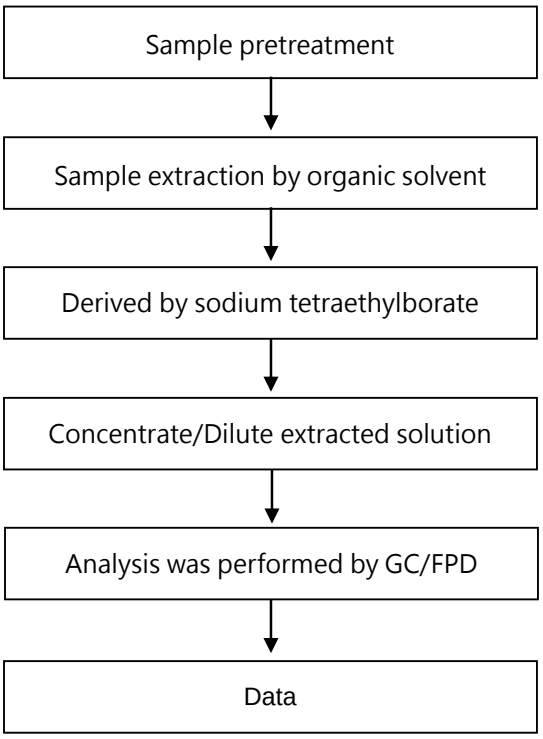
Analytical flow chart

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



TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

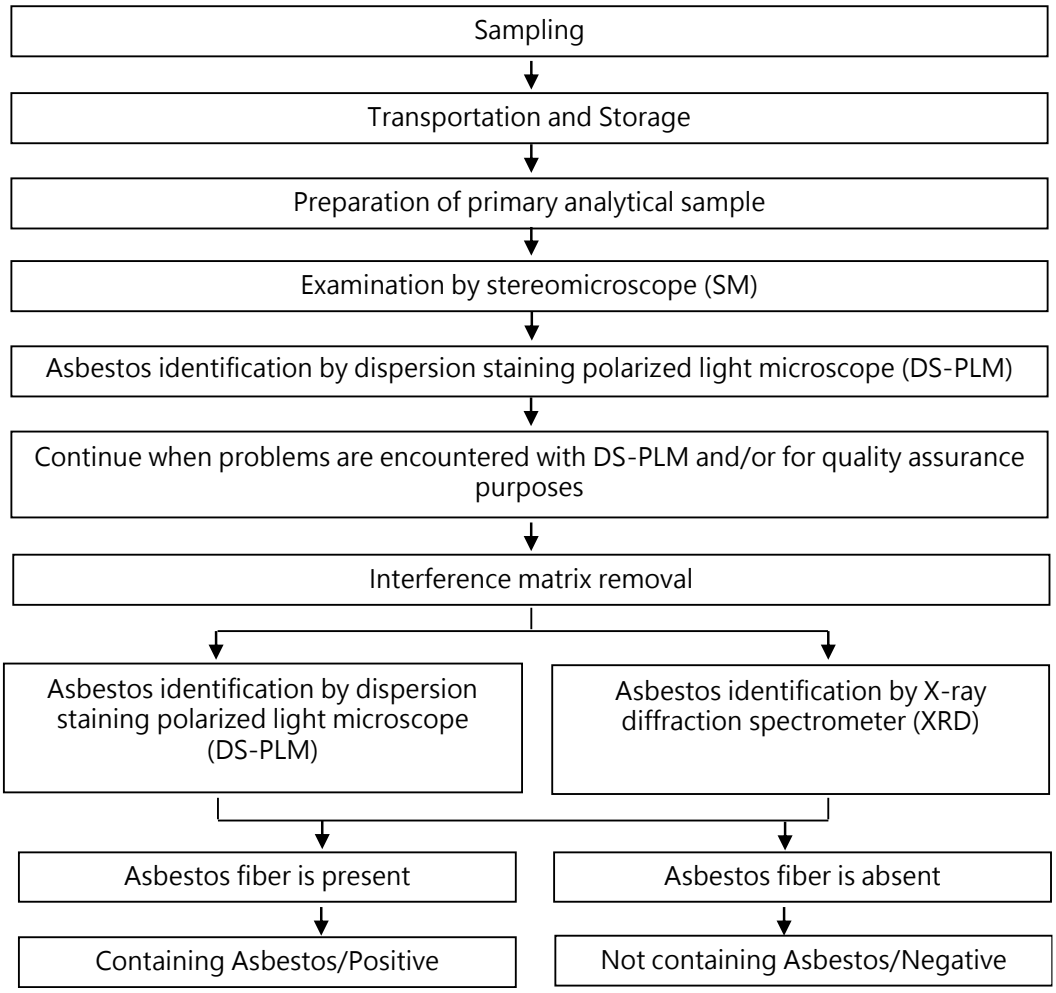
Analytical flow chart - Organic-Tin



TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

Analysis flow chart for determination of Asbestos

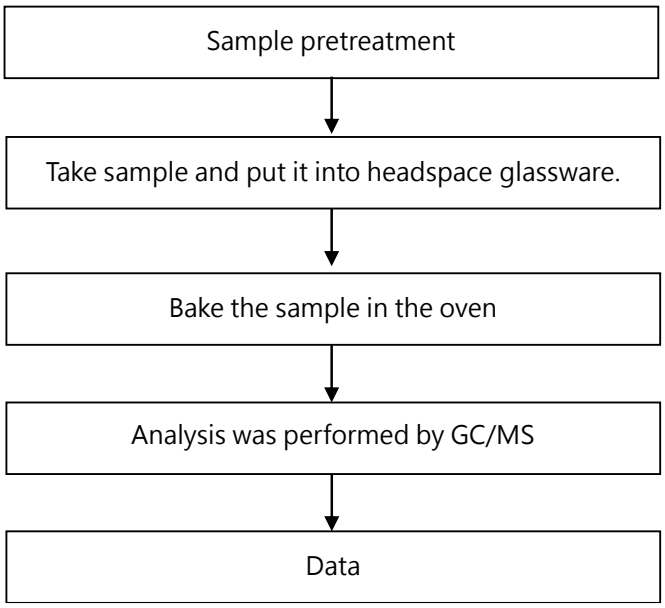
【Reference method: EPA 600/R-93/116】



TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

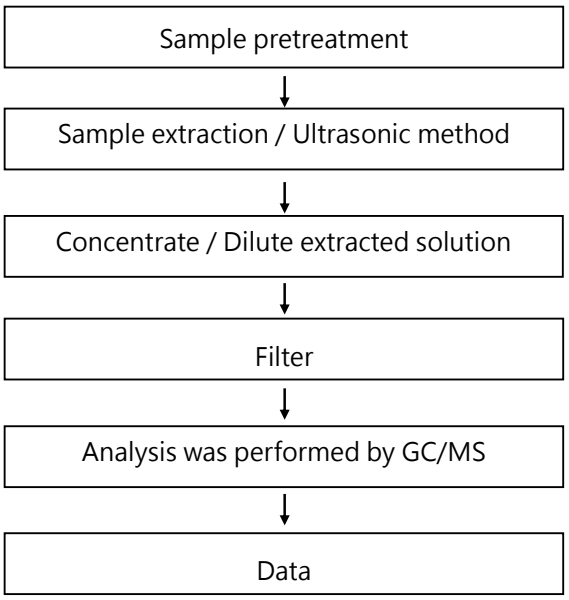
Analytical flow chart of volatile organic compounds (VOCs)

【Reference method：US EPA 5021A】



TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

Analytical flow chart - Persistent, Bioaccumulative, Toxic (PBTs)

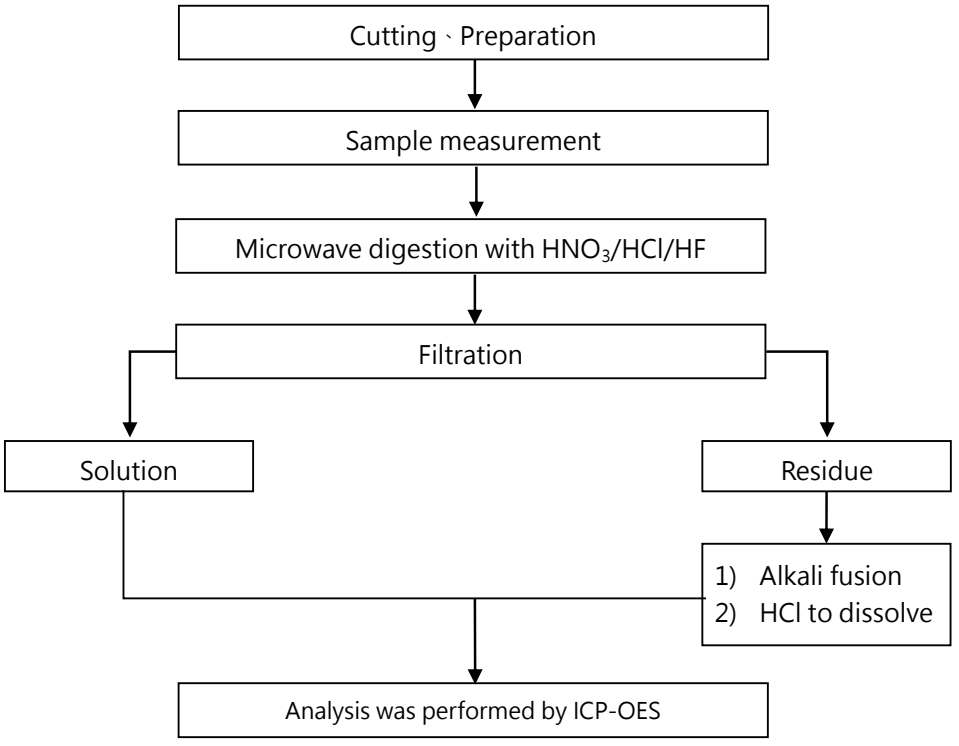


TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

Analytical flow chart of elements (Heavy metal included)

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

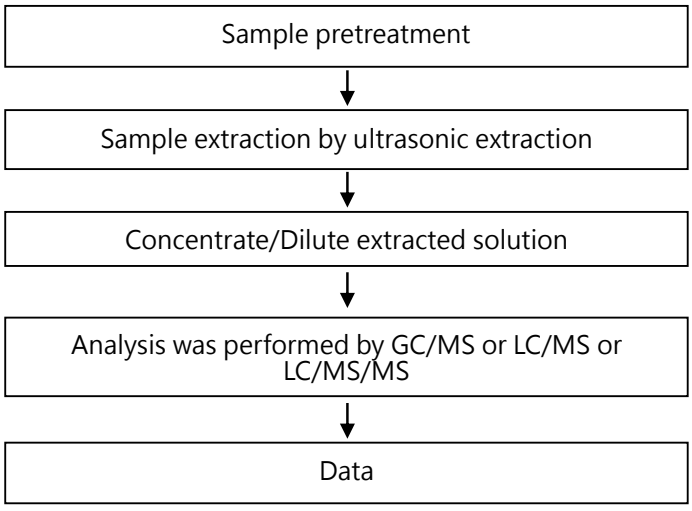
【Reference method：US EPA 3051A、US EPA 3052】



* US EPA 3051A method does not add HF.

TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

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

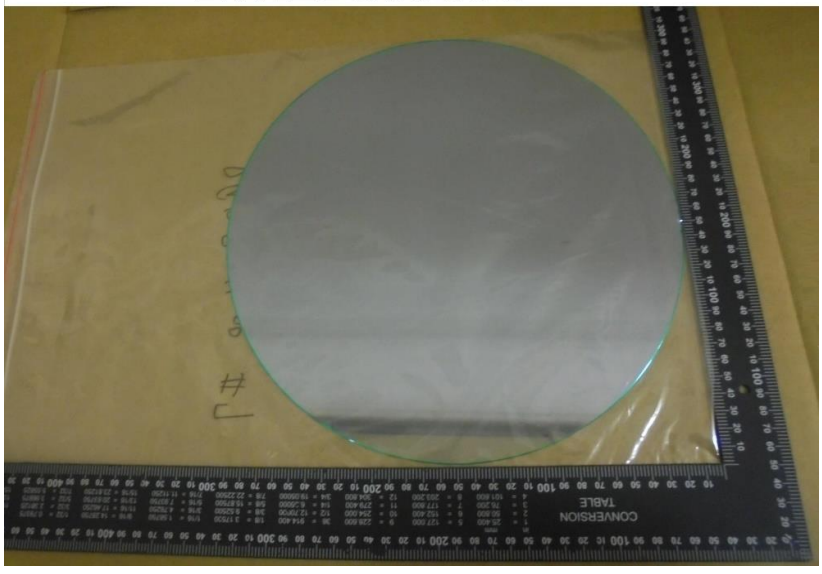


TAIWAN SEMICONDUCTOR MANUFACTURING COMPANY, LTD.
NO. 9, CREATION RD. I, HSINCHU SCIENCE PARK, HSINCHU, TAIWAN 300-77, R.O.C.

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

ETR22C00008

ETR22C00008



** End of Report **