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APPROVAL SHEET

CUSTOMER: 鈺緯科技開發股份有限公司

BRAND: ANPEC

PART NUMBER: APA2172AOI-TRG

設計驗證
工程課
2026 -04- 23
發行
鈺緯科技開發股份有限公司

CUSTOMER P/N: 3AAPA21721Y(A0578)

DATE: 2026/4/20

零件承認	
核准	負責人
	詮鼎科技股份有限公司 合約專用章(E) 許銘仁 合約專用章(E)
承認日期	2026 年 04 月 22 日

詮鼎科技股份有限公司
Asian Information Technology Inc.
業務人員：陳文豪 手機：0910088812

聲明：本公司是代理商，產品成分、環保成份分析數據等資料，以原廠提供資訊爲準。除原廠已提供之擔保外，不提供額外擔保(包括產品生命週期中之各式保證)。本聲明優先於一切約定。

Stereo, Differential Input Cap-Free Line Driver

Features

- **Operating Voltage: 2.3V~5.5V**
- **Differential Input**
- **Ground Reference Output**
  - **No Output Capacitor Required (for DC Blocking)**
  - **Save the PCB Space**
  - **Reduce the BOM Costs**
  - **Improve the Low Frequency Response**
- **Low Noise and THD+N**
  - **SNR > 108dB**
  - **Noise < 8μV_{rms}**
  - **THD+N < 0.02% at 20Hz~20kHz**
- **Output Voltage Swing Can Reach 2.1Vrms/Ch into 2.5kΩ at V_{DD}=3.3V**
- **High PSRR: 80dB at 217Hz**
- **Fast Start-up Time: 500ms**
- **Integrate the De-Pop Circuitry**
- **Thermal and Short-Circuit Protection**
- **Surface-Mount Packaging**
  - **SOP-14**
  - **TSSOP-14**
- **Lead Free and Green Devices Available (RoHS Compliant)**

Applications

- **Set-Top Boxes**
- **CD/DVD Players**
- **LCD TVs**
- **HTIBs (Home Theater in Box)**

General Description

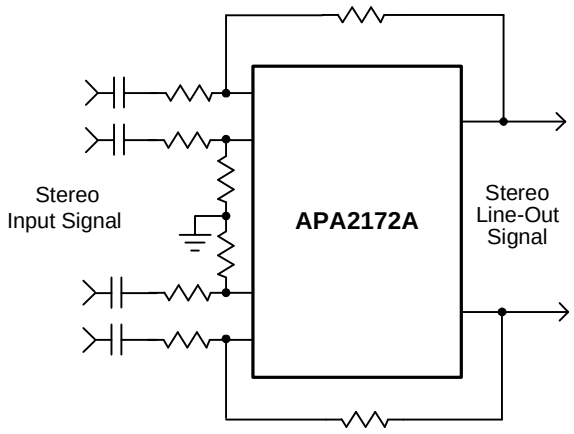
The APA2172A is a stereo, differential input, single supply, and cap-free line driver, which is available in SOP-14 and TSSOP-14 packages.

The APA2172A is ground-reference output, and doesn't need the output capacitors for DC blocking. The advantages of eliminating the output capacitor are saving the cost, eliminating component height, and improving the low frequency response.

The external gain setting is recommended using from ±1V/V to ±10V/V. High PSRR provides increased immunity to noise and RF rectification. APA2172A has shutdown and under-voltage detector function for Depop solution.

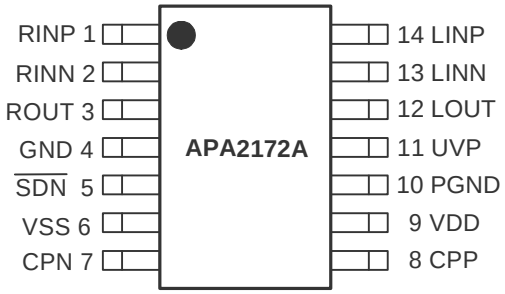
The APA2172A is capable of driving 2.1V_{rms} at 3.3V into 2.5kΩ load, and provides short-circuit and thermal protection.

Simplified Application Circuit

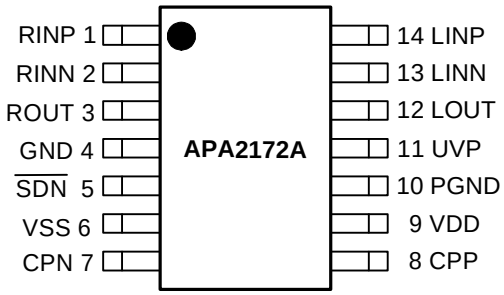


ANPEC reserves the right to make changes to improve reliability or manufacturability without notice, and advise customers to obtain the latest version of relevant information to verify before placing orders.

Pin Configuration



TSSOP-14
(Top View)



SOP-14
(Top View)

Ordering and Marking Information

APA2172A □□-□□□

- Assembly Material
- Handling Code
- Temperature Range
- Package Code

Package Code
O : TSSOP-14 K : SOP-14
Operating Ambient Temperature Range
I : -40 to 85 °C
Handling Code
TR : Tape & Reel
Assembly Material
G : Halogen and Lead Free Device

APA2172A O :	APA2172 XXXXXA	XXXXX - Date Code
APA2172A K :	APA2172A XXXXX	XXXXX - Date Code

Note: ANPEC lead-free products contain molding compounds/die attach materials and 100% matte tin plate termination finish; which are fully compliant with RoHS. ANPEC lead-free products meet or exceed the lead-free requirements of IPC/JEDEC J-STD-020D for MSL classification at lead-free peak reflow temperature. ANPEC defines “Green” to mean lead-free (RoHS compliant) and halogen free (Br or Cl does not exceed 900ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500ppm by weight).

Absolute Maximum Ratings (Note 1)

Symbol	Parameter	Rating	Unit
V_{PGND_GND}	PGND to GND Voltage	-0.3 to 0.3	V
V_{DD}	Supply Voltage (VDD to GND and PGND)	-0.3 to 6.0	
$V_{\overline{SDN}}$	Input Voltage ($\overline{SDN}$ to GND)	V_{GND}-0.3 to V_{DD}+0.3	
V_{SS}	VSS to GND and PGND Voltage	-6.0 to 0.3	
V_{OUT}	ROUT and LOUT to GND Voltage	V_{SS}-0.3 to V_{DD}+0.3	
V_{CPP}	CPP to PGND Voltage	V_{PGND}-0.3 to V_{DD}+0.3	
V_{CPN}	CPN to PGND Voltage	V_{SS}-0.3 to V_{PGND}+0.3	
T_J	Maximum Junction Temperature	150	°C
T_{STG}	Storage Temperature Range	-65 to +150	
T_{SDR}	Maximum Soldering Temperature Range, 10 Seconds	260	
P_D	Power Dissipation	Internally Limited	W

Note 1: Absolute Maximum Ratings are those values beyond which the life of a device may be impaired. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

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Thermal Characteristics

Symbol	Parameter		Typical Value	Unit
θ_{JA}	Thermal Resistance - Junction to Ambient (Note 2)	TSSOP-14	120	°C/W
		SOP-14	120	
θ_{JC}	Thermal Resistance - Junction to Case	TSSOP-14	32	°C/W
		SOP-14	32	

Note 2: Please refer to “Thermal Pad Consideration”. 2 layered 5 in2 printed circuit boards with 2oz trace and copper through several thermal vias. The thermal pad is soldered on the PCB.

Recommended Operating Conditions

Symbol	Parameter		Range		Unit
			Min.	Max.	
V_{DD}	Supply Voltage		2.3	5.5	V
V_{IH}	High Level Threshold Voltage	$\overline{SDN}$	1.0	-	
V_{IL}	Low Level Threshold Voltage	$\overline{SDN}$	-	0.35	
T_A	Operating Ambient Temperature Range		-40	85	°C
T_J	Operating Junction Temperature Range		-40	125	°C
R_L	Load Resistance		16	100k	Ω

Electrical Characteristics

V_{DD}=3.3V, V_{GND}=V_{PGND}=0V, V_{SDN}=V_{DD}, C_{CPF}=C_{CPO}=1µF, C_i=2.2µF, R_L=2.5kΩ, T_A=25°C, R_i=10kΩ, R_f=20kΩ (unless otherwise noted)

Symbol	Parameter	Test Conditions	APA2172A			Unit
			Min.	Typ.	Max.	
I_{DD}	V_{DD} Supply Current		-	10	15	mA
I_{SD}	V_{DD} Shutdown Current	$V_{\overline{SDN}}$=0V	-	1	5	µA
I_I	Input Current	$\overline{SDN}$	-	0.1	-	µA
CHARGE PUMP						
f_{OSC}	Switching Frequency		400	500	600	kHz
R_{eq}	Equivalent Resistance		-	21	25	Ω
DRIVERS						
A_{VO}	Open Loop Voltage Gain		80	100	-	dB
GW	Unity Gain Bandwidth		8	10	-	MHz
V_{SR}	Slew Rate		-	4.5	-	V/µs
V_{OS}	Output Offset Voltage	V_{DD}=2.3V to 5.5V, R_L = 2.5kΩ	-5	-	5	mV
V_N	Output Noise	R_i=10kΩ, R_f=10kΩ	-	8	15	μV_{rms}
$T_{start-up}$	Start-up Time		-	500	-	µs
PSRR	Power Supply Rejection Ratio	V_{DD}=2.3V to 5.5V, V_{rr}=200mV_{rms} f_{in}= 217Hz f_{in}= 1kHz f_{in}= 20kHz	-	 -80 -80 -50	 -60 -60 -45	dB
C_L	Maximum Capacitive Load		-	220	-	pF
V_{ESD}	ESD Protection	OUTR, OUTL	-	8	-	kV

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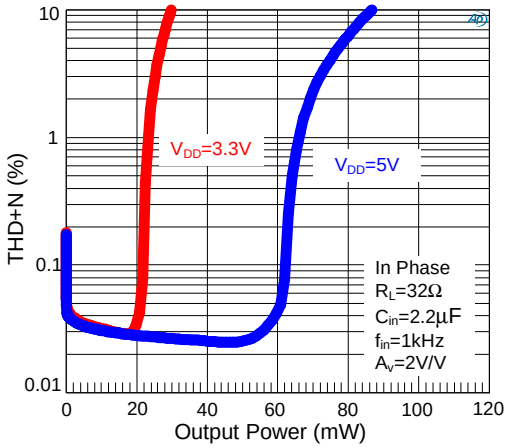
Electrical Characteristics (Cont.)

V_{DD}=3.3V, V_{GND}=V_{PGND}=0V, $V_{\overline{SDN}}$=V_{DD}, C_{CPF}=C_{CPO}=1μF, C_i=2.2μF, R_L=2.5kΩ, T_A=25°C, R_i=10kΩ, R_f=20kΩ (unless otherwise noted)

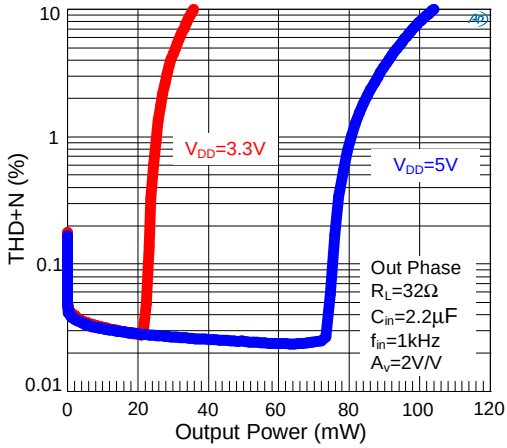
Symbol	Parameter	Test Conditions	APA2172A			Unit
			Min.	Typ.	Max.	
V_O	Output Voltage (Stereo, In Phase)	THD+N=1%, f_{in}=1kHz R_L=2.5kΩ R_L=100kΩ	2.0 -	2.1 2.3	-	V
P_O	Output Power (Stereo, In Phase)	THD+N=1%, f_{in}=1kHz R_L=32Ω	16	20	-	mW
		VDD=5V THD+N=1%, f_{in}=1kHz R_L=32Ω	48	60	-	
THD+N	Total Harmonic Distortion Plus Noise	V_O=2V_{rms}, R_L=2.5kΩ f_{in}=20Hz f_{in}=1kHz f_{in}=20kHz	-	0.02 0.001 0.02	- 0.002 -	%
		Po=10mW, RL=32Ω,f_{in}=1kHz	-	0.03	-	
		VDD=5V, Po=30mW, RL=32Ω, f_{in}=1kHz	-	0.03	-	
Crosstalk	Channel Separation	V_O=2V_{rms}, R_L=2.5kΩ f_{in}=20Hz f_{in}=1kHz f_{in}=20kHz	-	100 100 90	-	dB
S/N	Signal to Noise Ratio	V_O=2Vrms, R_L=2.5kΩ, R_i=10kΩ, R_f=10kΩ, With A-weighting Filter	102	108	-	dB
T_{SD}	Thermal Shutdown Protection Temperature		-	150	-	°C
UVP FUNCTION						
V_{UVP}	External Under Voltage Detection		1.1	1.25	1.35	V
I_{HYS}	External Under Voltage Detection Hysteresis Current		-	5.0	-	μA

Typical Operating Characteristics

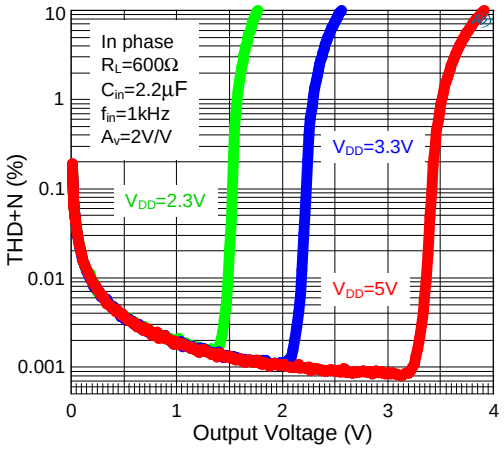
THD+N vs. Output Power



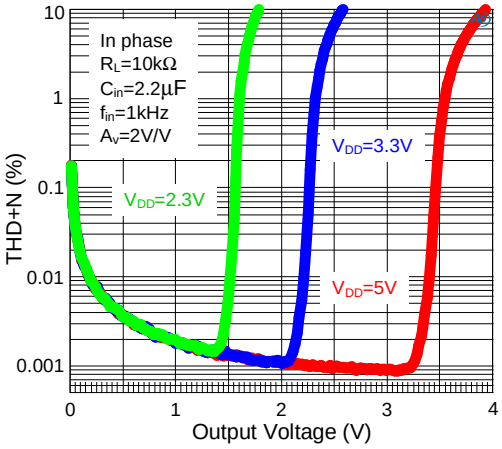
THD+N vs. Output Power



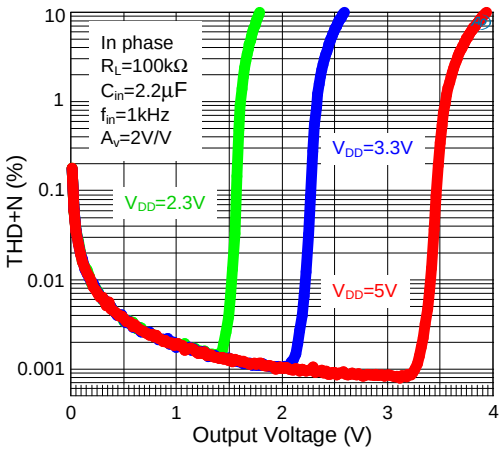
THD+N vs. Output Voltage



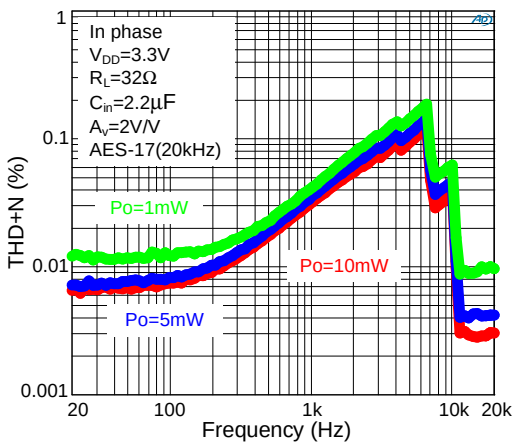
THD+N vs. Output Voltage



THD+N vs. Output Voltage



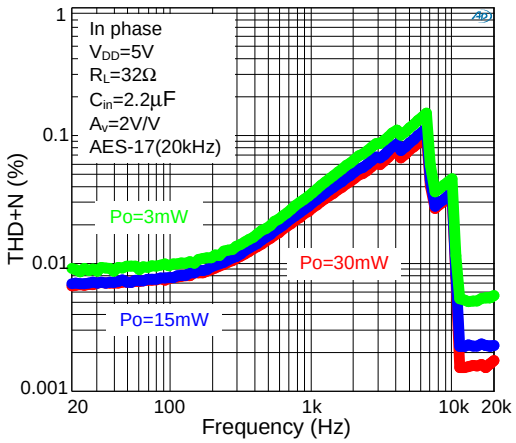
THD+N vs. Frequency



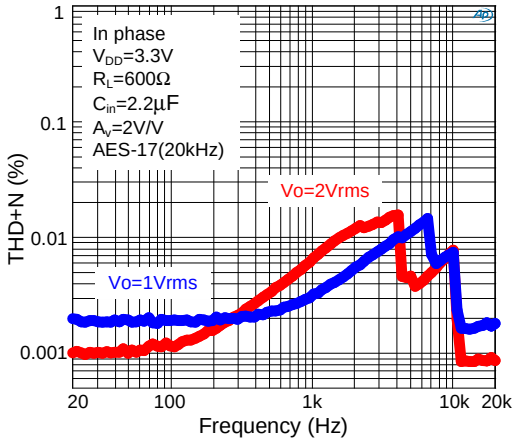
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Typical Operating Characteristics

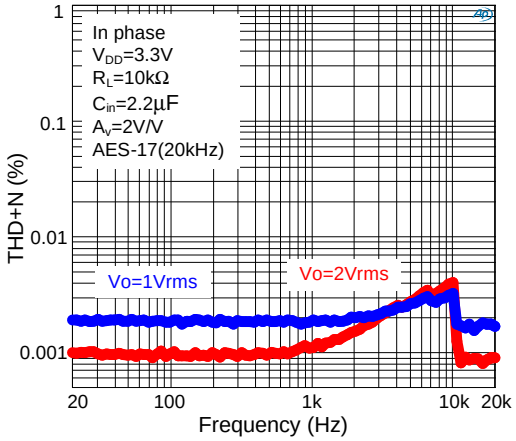
THD+N vs. Frequency



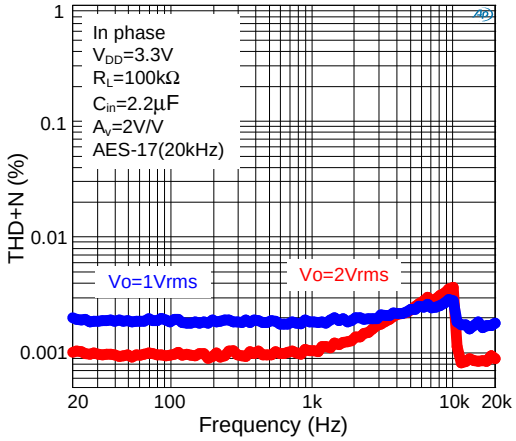
THD+N vs. Frequency



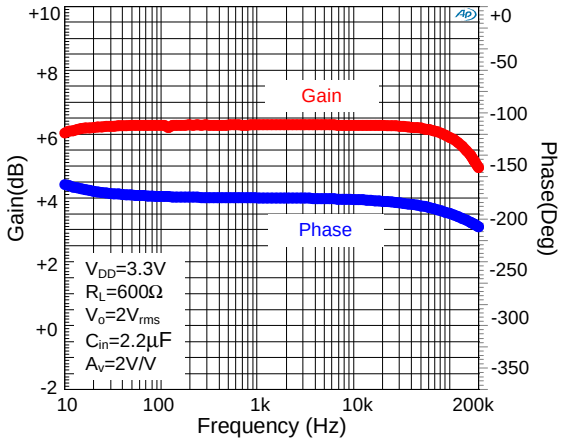
THD+N vs. Frequency



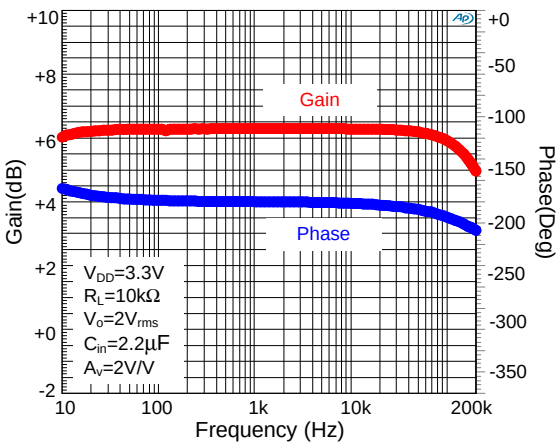
THD+N vs. Frequency



Frequency Response



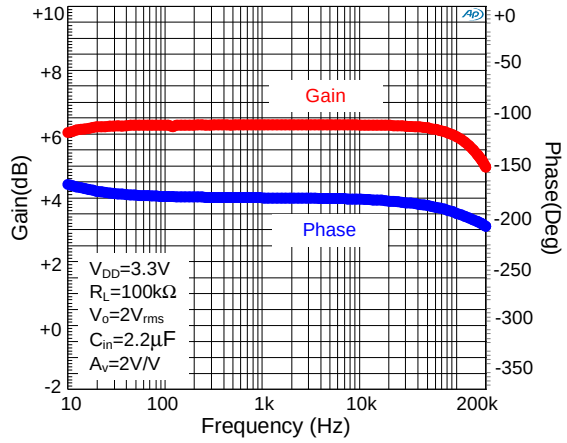
Frequency Response



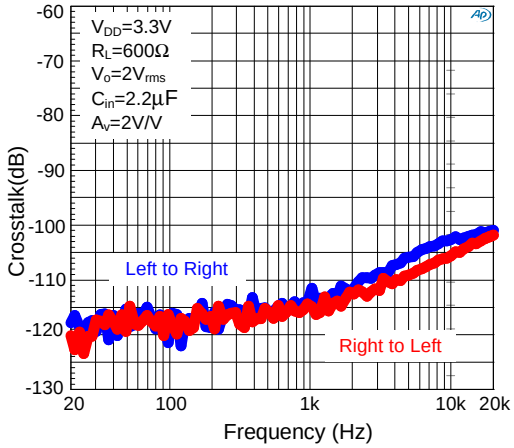
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Typical Operating Characteristics (Cont.)

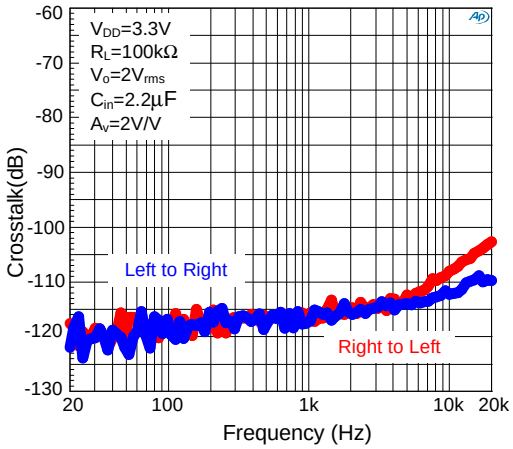
Frequency Response



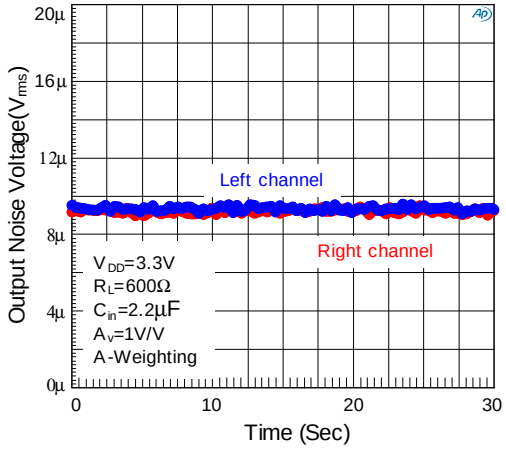
Crosstalk vs. Frequency



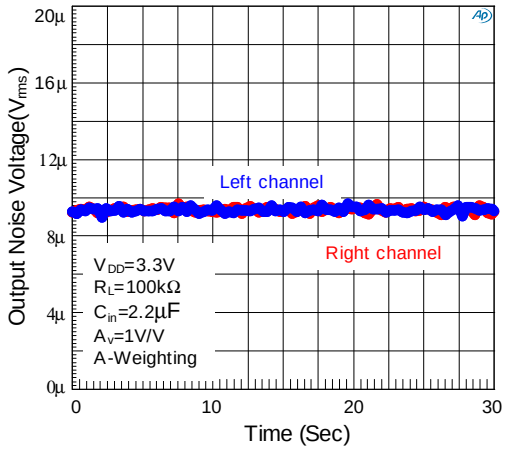
Crosstalk vs. Frequency



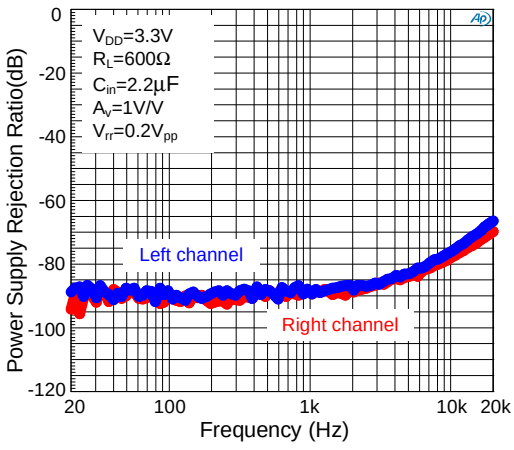
Output Noise Voltage vs. Time



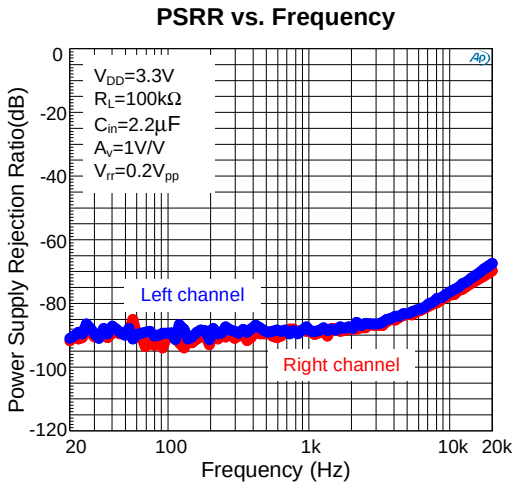
Output Noise Voltage vs. Time

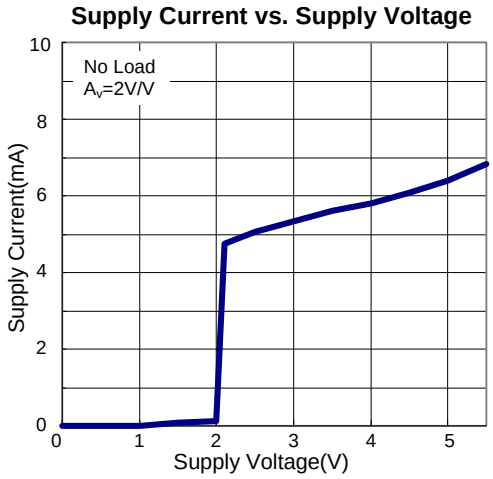


PSRR vs. Frequency



Typical Operating Characteristics (Cont.)

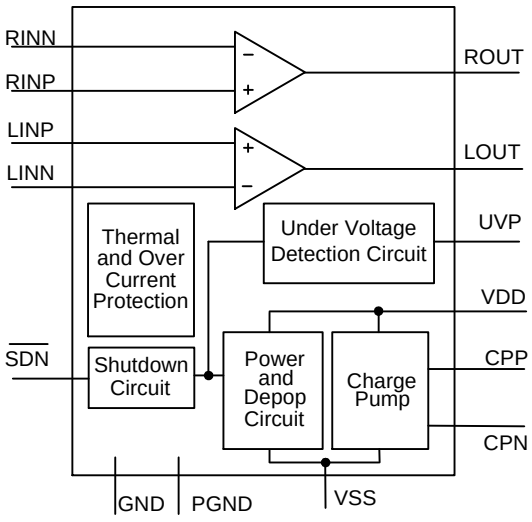




Pin Description

PIN		I/O/P	FUNCTION
NO.	NAME		
1	RINP	I	Right channel non-inverting input.
2	RINN	I	Right channel inverting input.
3	ROUT	O	Right channel output.
4	GND	P	Signal ground.
5	$\overline{SDN}$	I	Shutdown mod control input signal, pull low for shutdown headphone driver. This pin should be connect a 100Ω Protection Resistor.
6	VSS	P	Headphone driver negative power supply.
7	CPN	I/O	Charge pump flying capacitor negative connection.
8	CPP	I/O	Charge pump flying capacitor positive connection.
9	VDD	P	Supply voltage input.
10	PGND	P	Power ground.
11	UVP	I	Under voltage protection input. Floating or Pull “H” to disable this function.
12	LOUT	O	Left channel output.
13	LINN	I	Left channel inverting input.
14	LINP	I	Left channel non-inverting input.

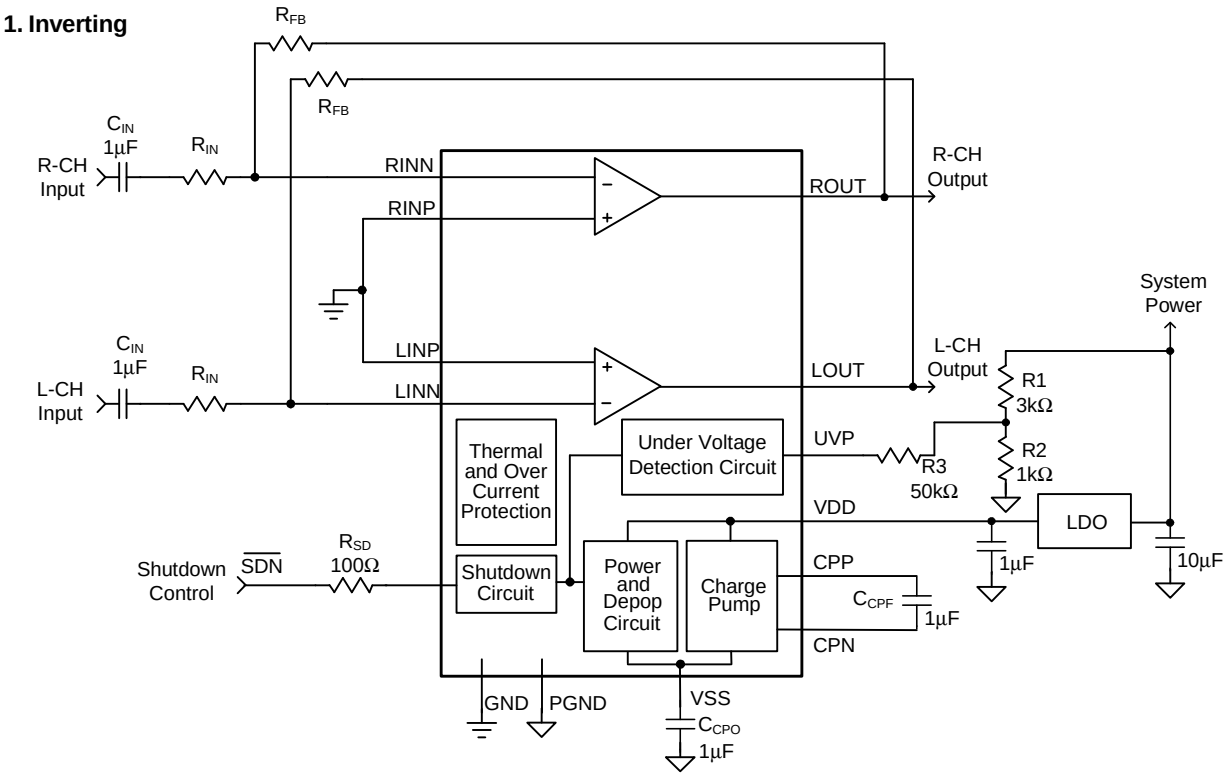
Block Diagram



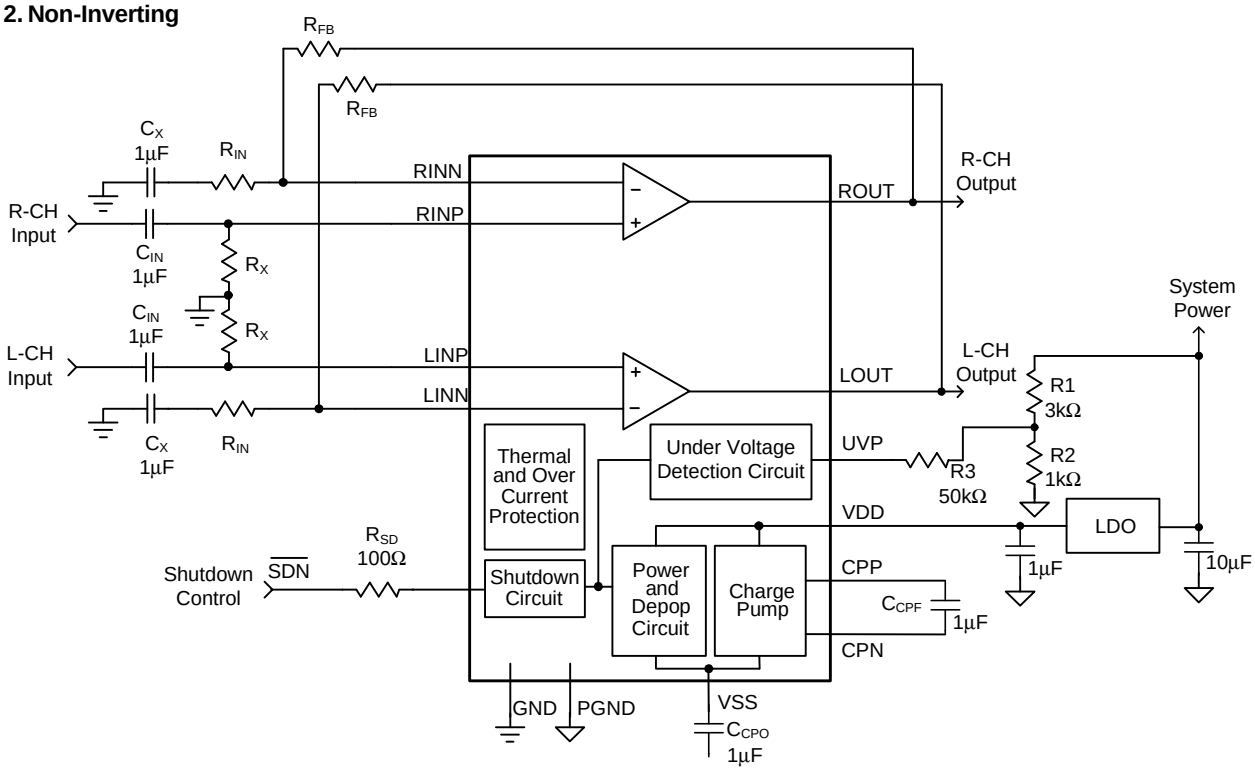
Typical Application Circuit

Line Driver Amplifier

1. Inverting



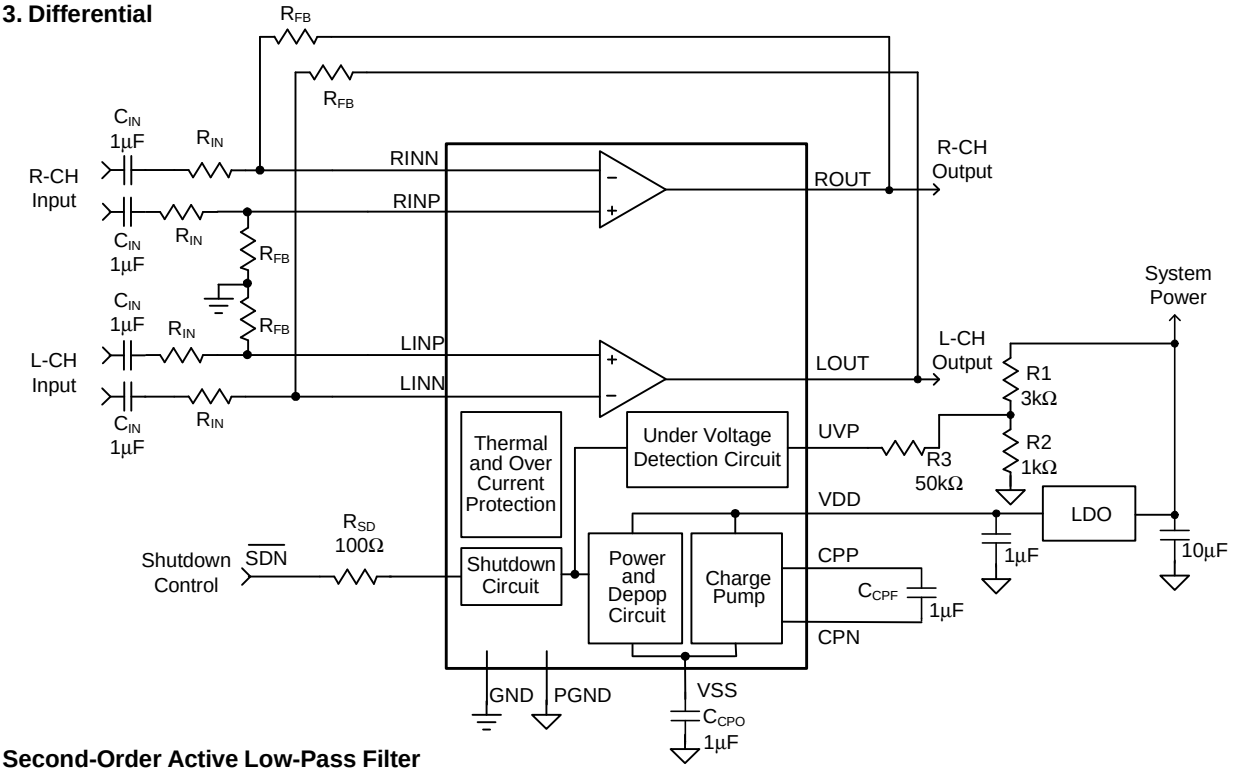
2. Non-Inverting



Typical Application Circuit (Cont.)

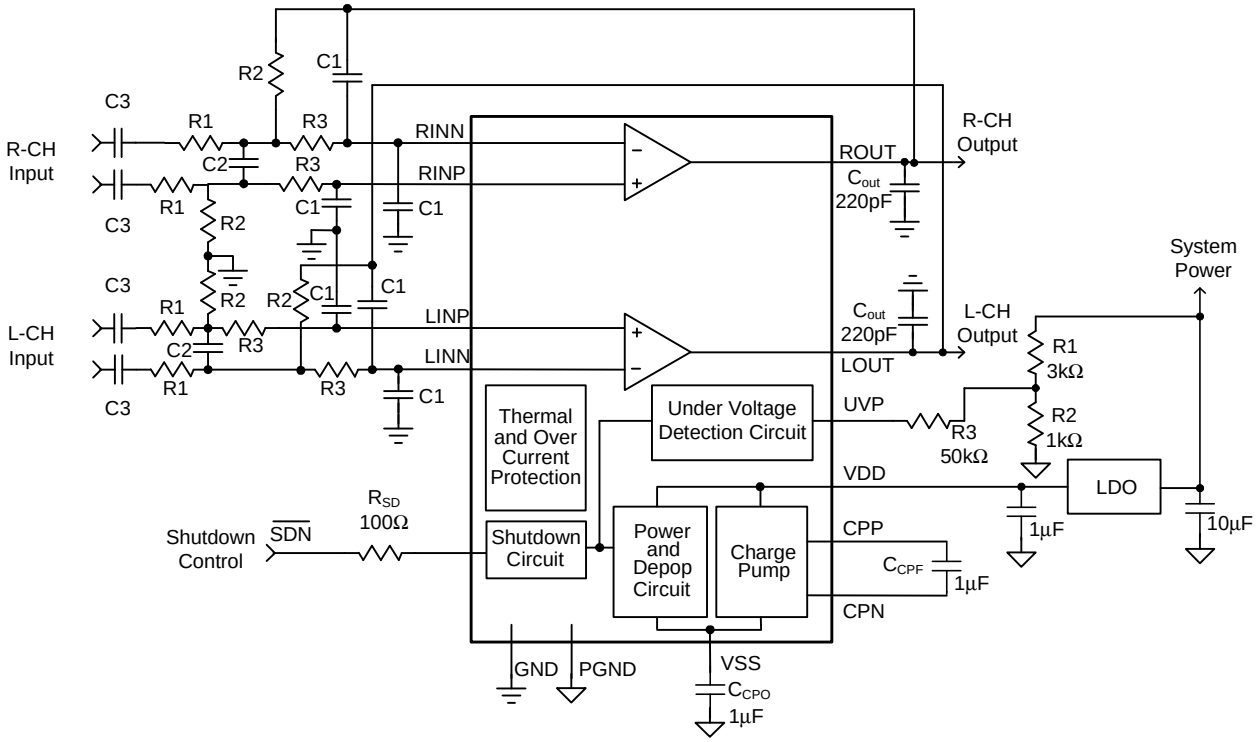
Line Driver Amplifier (Cont.)

3. Differential



Second-Order Active Low-Pass Filter

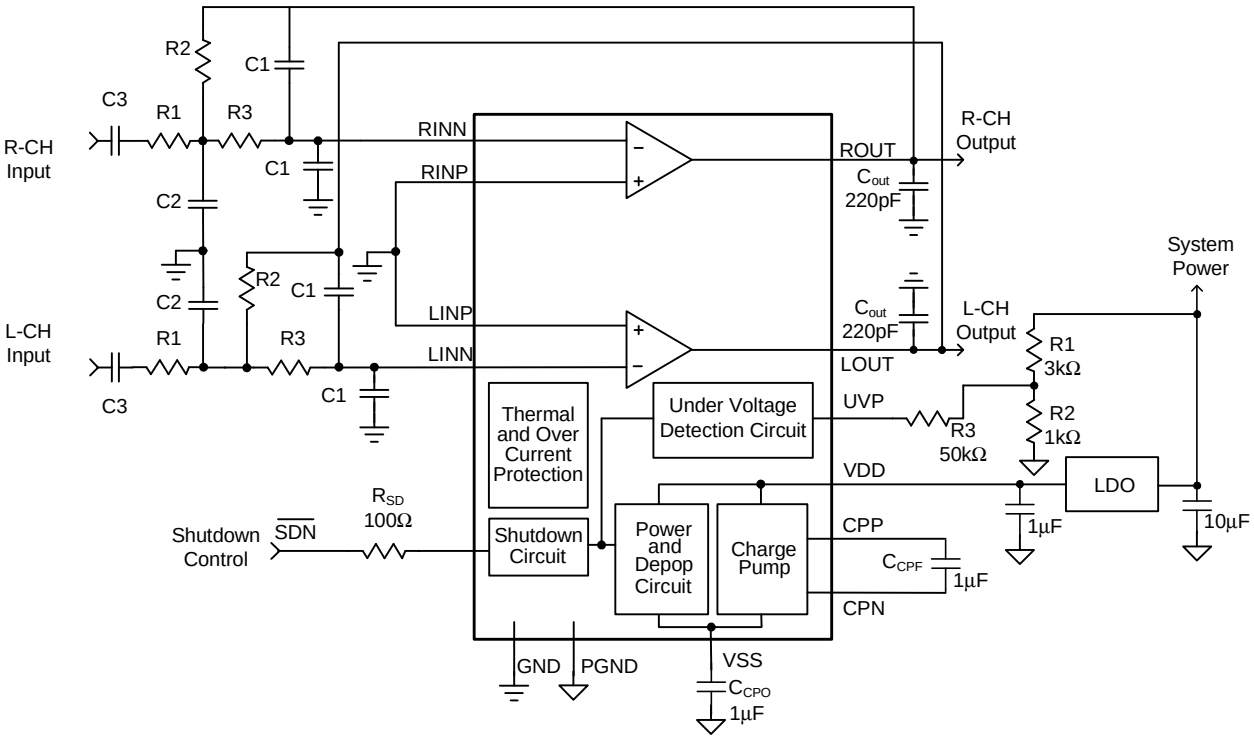
1. Differential



Typical Application Circuit (Cont.)

Second-Order Active Low-Pass Filter

2. Inverting



Function Description

Line Driver Operation

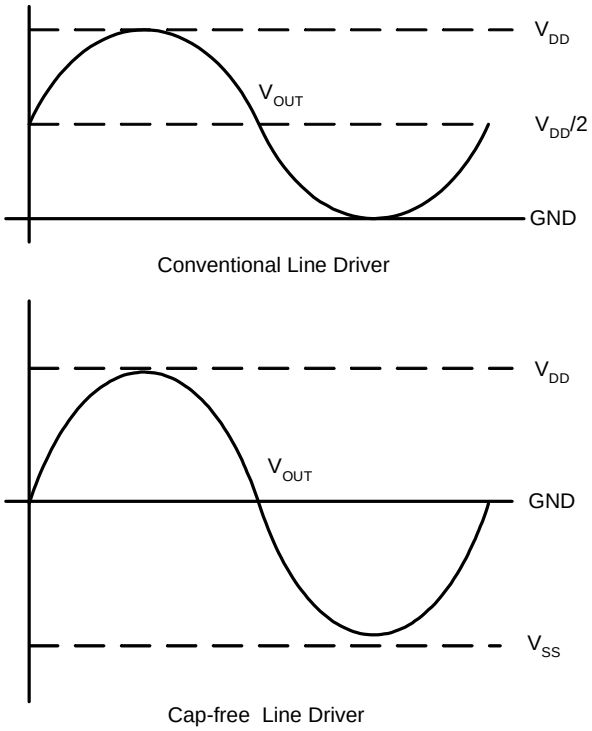


Figure 1. Cap-free Operation

The APA2172A's line drivers use a charge pump to invert the positive power supply (V_{DD}) to negative power supply (V_{SS}), see figure1. The headphone drivers operate at this bipolar power supply (V_{DD} and V_{SS}) and the outputs reference refers to the ground. This feature eliminates the output capacitor that is using in conventional single-ended headphone drive amplifier. Compare with the single power supply amplifier, the power supply range has almost doubled.

Thermal Protection

The thermal protection circuit limits the junction temperature of the APA2172A. When the junction temperature exceeds T_J=+150°C, a thermal sensor turns off the driver, allowing the devices to cool. The thermal sensor allows the driver to start-up after the junction temperature down about 125°C. The thermal protection is designed with a 25°C hysteresis to lower the average T_J during continuous thermal overload conditions, increasing lifetime of the ICs.

Shutdown Function

In order to reduce power consumption while not in use, the APA2172A contains shutdown controllers to externally turn off the amplifier bias circuitry. This shutdown feature turns the amplifier off when logic low is placed on the $\overline{SDN}$ pins for the APA2172A. The trigger point between a logic high is 1.0V and logic low level is 0.35V. It is recommended to switch between ground and the supply voltage V_{DD} to provide maximum device performance. By switching the $\overline{SDN}$ pins to a low level, the amplifier enters a low-consumption current circumstance, charge pump is disabled, and I_{DD} for the APA2172A is in shutdown mode. In normal operating, the APA2172A's $\overline{SDN}$ pins should be pulled to a high level to keep the IC out of the shutdown mode. The $\overline{SDN}$ pins should be tied to a definite voltage to avoid unwanted circumstance changes.

Under-Voltage Protection

External under voltage detection can be used to shutdown the APA2172A before an input device can generate a pop. The shutdown threshold at the UVP pin is 1.25V. The user selects a resistor divider to obtain the shutdown threshold and hysteresis for the specific application. The thresholds can be determined as below:

VUVP = (1.25-6μAxR3) x (R1+R2)/R2

Hysteresis = 5μA x R3 x (R1+R2)/R2

With the condition: R3>>R1//R2

For example, to obtain V_{UVP}=3.8V and 1V hysteresis, R1= 3kΩ, R2=1kΩ and R3=50kΩ.

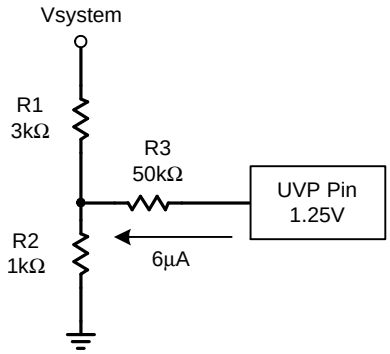


Figure 2. Under-Voltage Protection

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Application Information

Using The APA2172A As A Second-Order Filter

Several audio DACs used today require an external low-pass filter to remove out-of-band noise. This is possible with the APA2172A, as it can be used like a standard Operational Amplifier. Several filter topologies can be implemented, both single-ended and differential. In Figure 3, a multi-feedback (MFB) with differential input and single-ended input is shown.

An ac-coupling capacitor to remove dc content from the source is shown; it serves to block any dc content from the source and lowers the dc-gain to 1, helping reducing the output dc-offset to minimum.

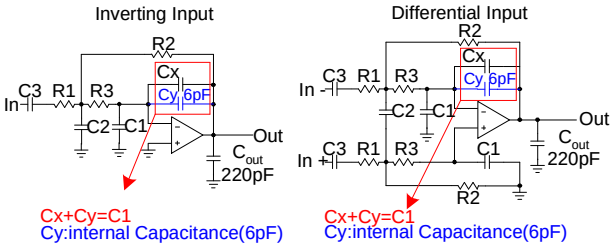


Figure 3. Second-Order Active Low-Pass Filter

Table 1: Filter Specifications.

Gain (V/V)	High Pass (Hz)	Low Pass (kHz)	C1 (pF)	C2 (pF)	C3 (mF)	R1 (kW)	R2 (kW)	R3 (kW)
-1	1.6	40	100	680	10	10	10	24
-1.5	1.3	40	68	680	15	8.2	12	30
-2	1.6	60	33	150	6.8	15	30	47
-2	1.6	30	47	470	6.8	15	30	43
-3.33	1.2	30	33	470	10	13	43	43
-10	1.5	30	22	1000	22	4.7	47	27

For Inverting Input, The overall gain is:

$$A_V = -\frac{R2}{R1} \quad (1)$$

The high pass filter's cutoff frequency is:

$$f_{c(highpass)} = \frac{1}{2\pi R1C3} \quad (2)$$

The low pass filter's cutoff frequency is:

$$f_{c(lowpass)} = \frac{1}{2\pi\sqrt{R2R3C1C2}} \quad (3)$$

Input Capacitor, C_i

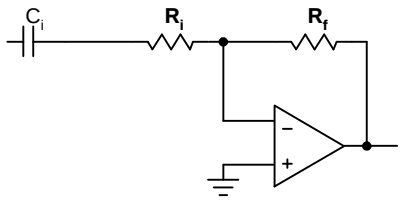


Figure 4. Typical Application Circuit

In the typical application, an input capacitor, C_i, is required to allow the amplifier to bias the input signal to the proper DC level for optimum operation. In this case, C_i and the minimum input impedance R_i from a high-pass filter with the corner frequency are determined in the following equation:

$$f_{c(highpass)} = \frac{1}{2\pi R_i C_i} \quad (4)$$

The value of C_i must be considered carefully because it directly affects the low frequency performance of the circuit. R_i is the external input resistance that typical value is 10kΩ and the specification calls for a flat bass response down to 20Hz. Equation is reconfigured as below:

$$C_i = \frac{1}{2\pi R_i f_{c(highpass)}} \quad (5)$$

When the input resistance variation is considered, the C_i is 0.8µF, so a value in the range of 1µF to 2.2µF would be chosen. A further consideration for this capacitor is the leakage path from the input source through the input network (R_i + R_f, C_i) to the load.

This leakage current creates a DC offset voltage at the input to the amplifier that reduces useful headroom, especially in high gain applications. For this reason, a low leakage tantalum or ceramic capacitor is the best choice. When polarized capacitors are used, the negative side of the capacitor should face the amplifiers' input in most applications because the DC level of the amplifiers' input is held at GND. Please note that it is important to confirm the capacitor polarity in the application.

Input Resistor, R_i

The gain of the APA2172A is be set by the external input resistor (R_i) and external feedback resistor (R_f). Please see the figure 4.

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Application Information (Cont.)

Input Resistor, R_i (Cont.)

$$\text{Gain}\,(A_V) = \frac{R_f}{R_i} \quad (6)$$

The external gain setting is recommended using from -1V/V to -10V/V, and the R_i is in the range from 1kΩ to 47kΩ. It's recommended to use 1% tolerance resistor or better. Keep the input trace as short as possible to limit the noise injection.

The gain is recommended to set -1V/V, and R_i is 10kΩ, and R_f is 10kΩ.

Feedback Resistor, R_f

Refer the figure 4, the external gain is setting by R_i and R_f; and the gain setting is recommended using from -1V/V to -10V/V. The R_f is in the range from 4.7kΩ to 100kΩ. It's recommended to use 1% tolerance resistor or better.

Power Supply Decoupling, C_s

The APA2172A is a high-performance CMOS audio amplifier that requires adequate power supply decoupling to ensure the output total harmonic distortion (THD+N) is as low as possible. Power supply decoupling also prevents the oscillations being caused by long lead length between the amplifier and the speaker.

The optimum decoupling is achieved by using two different types of capacitors that target on different types of noise on the power supply leads. For higher frequency transients, spikes, or digital hash on the line, a good low equivalent-series-resistance (ESR) ceramic capacitor, typically 0.1µF, is placed as close as possible to the device VDD and PVDD lead for the best performance. For filtering lower frequency noise signals, a large aluminum electrolytic capacitor of 10µF or greater placed near the audio power amplifier is recommended.

Charge Pump Flying Capacitor, C_{CPF}

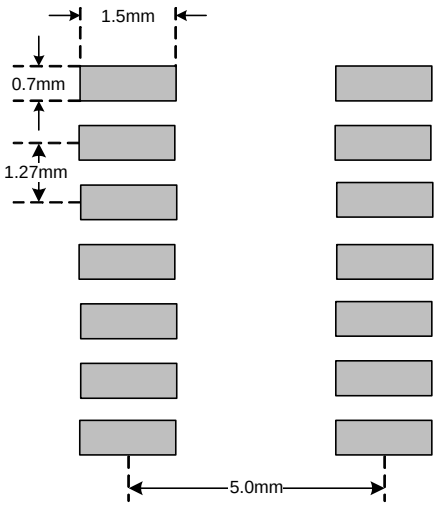
The flying capacitor affects the load transient of the charge pump. If the capacitor's value is too small, then that will degrade the charge pump's current driver capability and the performance of line drive amplifier.

Increasing the flying capacitor's value will improve the load transient of charge pump. It is recommended using the low ESR ceramic capacitors (X7R type is recommended) above 1µF.

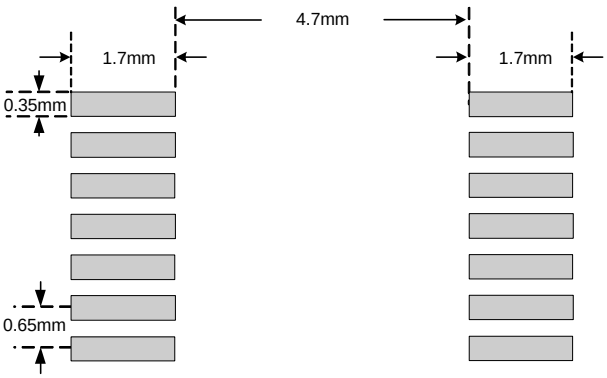
Charge Pump Output Capacitor, C_{CPO}

The output capacitor's value affects the power ripple directly at CV_{SS} (V_{SS}). Increasing the value of output capacitor reduces the power ripple. The ESR of output capacitor affects the load transient of CV_{SS} (V_{SS}). Lower ESR and greater than 1µF ceramic capacitor is a recommendation.

Layout Recommendation



SOP-14 Land Pattern Recommendation

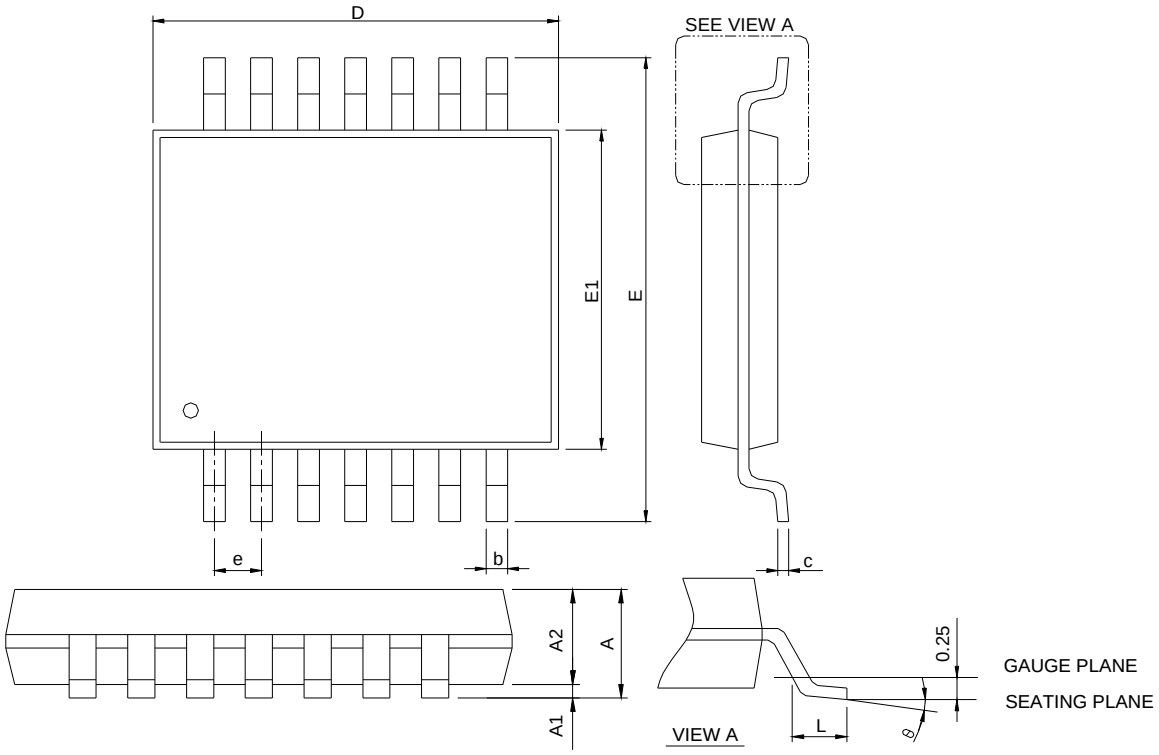


TSSOP-14 Land Pattern Recommendation

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Package Information

TSSOP-14

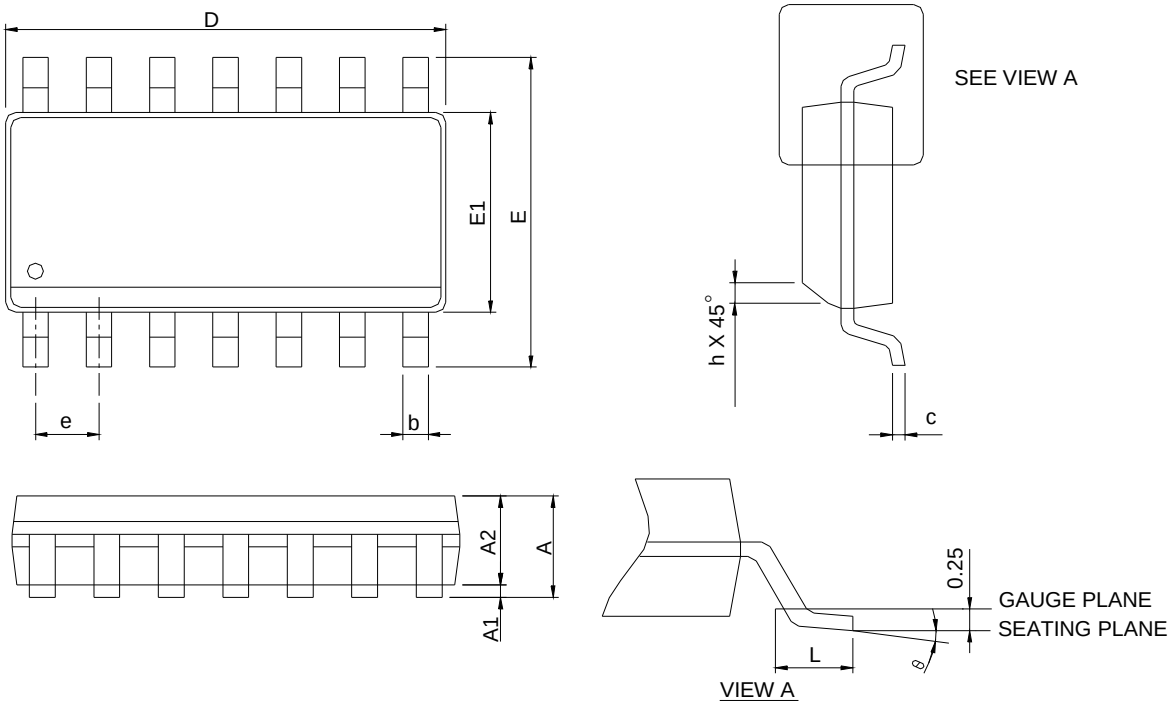


SYMBOL	TSSOP-14			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A		1.20		0.047
A1	0.05	0.15	0.002	0.006
A2	0.80	1.05	0.031	0.041
b	0.19	0.30	0.007	0.012
c	0.09	0.20	0.004	0.008
D	4.90	5.10	0.193	0.201
E	6.20	6.60	0.244	0.260
E1	4.30	4.50	0.169	0.177
e	0.65 BSC		0.026 BSC	
L	0.45	0.75	0.018	0.030
θ	0°	8°	0°	8°

Note : 1. Follow from JEDEC MO-153 AB-1.
2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side.
3. Dimension "E1" does not include inter-lead flash or protrusions. Inter-lead flash and protrusions shall not exceed 10 mil per side.

Package Information

SOP-14

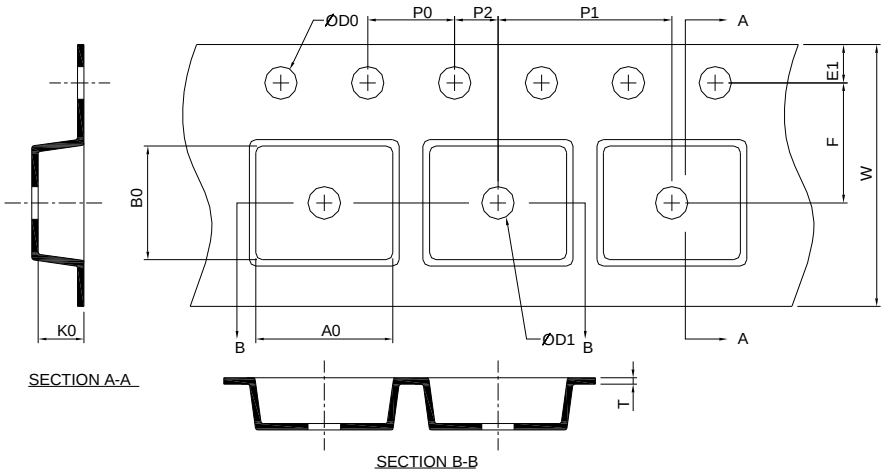


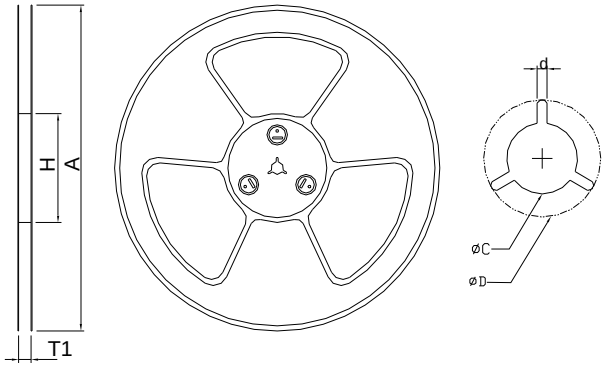
SYMBOL	SOP-14			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A		1.75		0.069
A1	0.10	0.25	0.004	0.010
A2	1.25		0.049	
b	0.31	0.51	0.012	0.020
c	0.17	0.25	0.007	0.010
D	8.55	8.75	0.337	0.344
E	5.80	6.20	0.228	0.244
E1	3.80	4.00	0.150	0.157
e	1.27 BSC		0.050 BSC	
h	0.25	0.50	0.010	0.020
L	0.40	1.27	0.016	0.050
θ	0°	8°	0°	8°

Note: 1. Follow JEDEC MS-012 AB.
2. Dimension “D” does not include mold flash, protrusions or gate burrs.
Mold flash, protrusion or gate burrs shall not exceed 6 mil per side.
3. Dimension “E” does not include inter-lead flash or protrusions.
Inter-lead flash and protrusions shall not exceed 10 mil per side.

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Carrier Tape & Reel Dimensions





Application	A	H	T1	C	d	D	W	E1	F
TSSOP-14	330.0±2.00	50 MIN.	16.4+2.00 -0.00	13.0+0.50 -0.20	1.5 MIN.	20.2 MIN.	12.0±0.30	1.75±0.10	5.50±0.10
	P0	**P1**	**P2**	**D0**	**D1**	**T**	**A0**	**B0**	**K0**
	4.00±0.10	8.00±0.10	2.00±0.10	1.5+0.10 -0.00	1.5 MIN.	0.6+0.00 -0.40	6.40±0.20	5.20±0.20	1.60±0.20
Application	**A**	**H**	**T1**	**C**	**d**	**D**	**W**	**E1**	**F**
SOP-14	330.0±2.00	50 MIN.	16.4+2.00 -0.00	13.0+0.50 -0.20	1.5 MIN.	20.2 MIN.	16.0±0.30	1.75±0.10	7.50±0.10
	P0	**P1**	**P2**	**D0**	**D1**	**T**	**A0**	**B0**	**K0**
	4.0±0.10	8.0±0.10	2.0±0.10	1.5+0.10 -0.00	1.5 MIN.	0.6+0.00 -0.40	6.40±0.20	9.00±0.20	2.10±0.20

(mm)

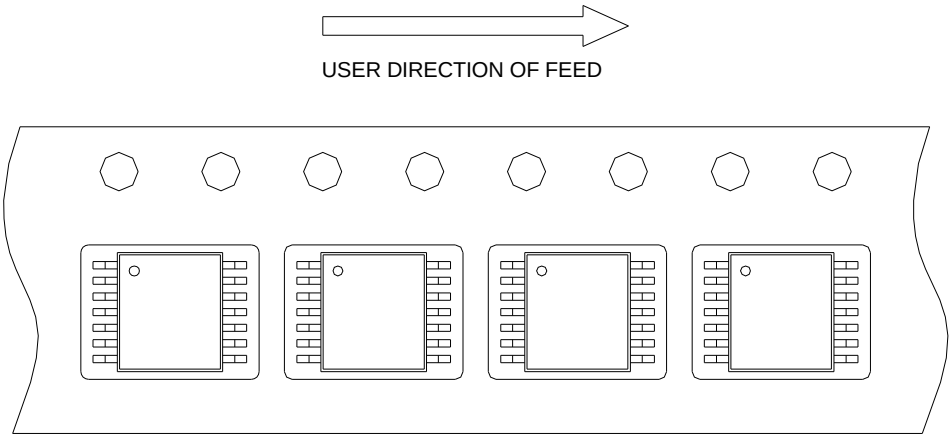
Devices Per Unit

Package Type	Unit	Quantity
TSSOP-14	Tape & Reel	2500
SOP-14	Tape & Reel	2500

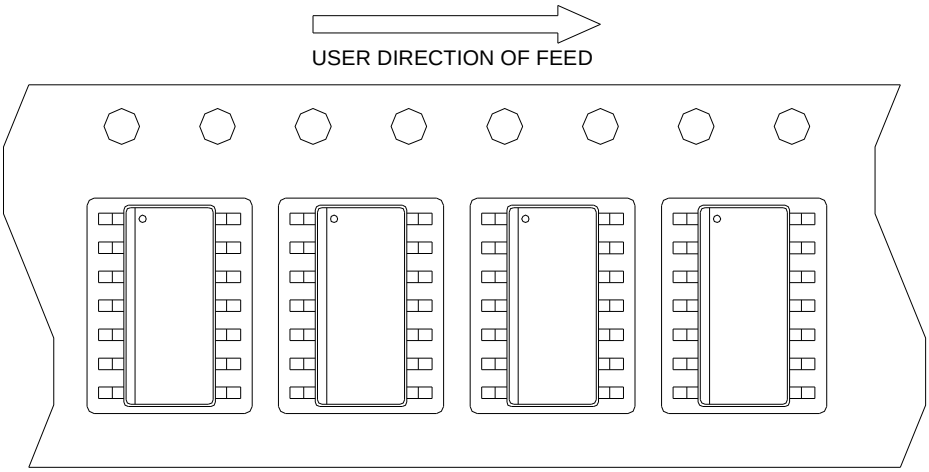
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Taping Direction Information

TSSOP-14

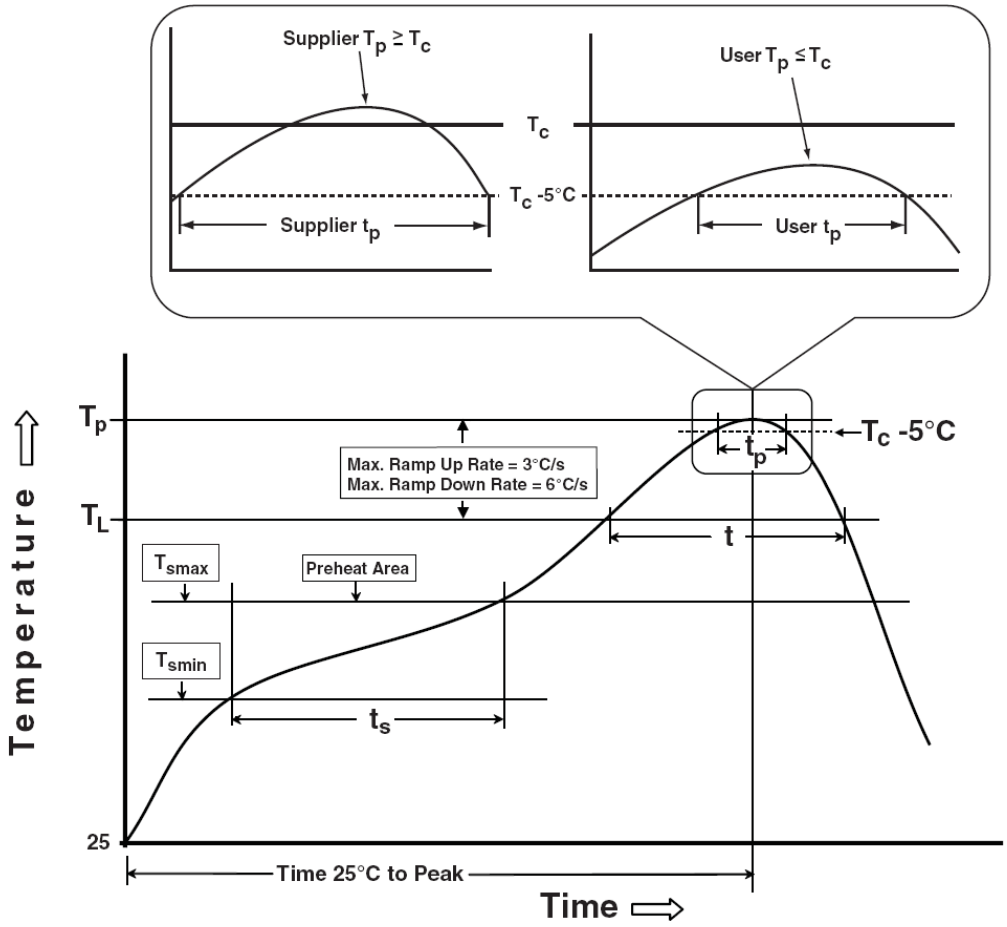


SOP-14



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Classification Profile



Classification Reflow Profiles

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Preheat & Soak Temperature min (T_{smin}) Temperature max (T_{smax}) Time (T_{smin} to T_{smax}) (t_s)	100 °C 150 °C 60-120 seconds	150 °C 200 °C 60-120 seconds
Average ramp-up rate (T_{smax} to T_P)	3 °C/second max.	3 °C/second max.
Liquidous temperature (T_L) Time at liquidous (t_L)	183 °C 60-150 seconds	217 °C 60-150 seconds
Peak package body Temperature (T_p)*	See Classification Temp in table 1	See Classification Temp in table 2
Time (t_P)** within 5°C of the specified classification temperature (T_c)	20** seconds	30** seconds
Average ramp-down rate (T_p to T_{smax})	6 °C/second max.	6 °C/second max.
Time 25°C to peak temperature	6 minutes max.	8 minutes max.
* Tolerance for peak profile Temperature (T_p) is defined as a supplier minimum and a user maximum. ** Tolerance for time at peak profile temperature (t_p) is defined as a supplier minimum and a user maximum.		

Classification Reflow Profiles (Cont.)

Table 1. SnPb Eutectic Process – Classification Temperatures (Tc)

Package Thickness	Volume mm^3 <350	Volume mm^3 350
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

Table 2. Pb-free Process – Classification Temperatures (Tc)

Package Thickness	Volume mm^3 <350	Volume mm^3 350-2000	Volume mm^3 >2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 mm – 2.5 mm	260 °C	250 °C	245 °C
≥2.5 mm	250 °C	245 °C	245 °C

Reliability Test Program

Test item	Method	Description
SOLDERABILITY	JESD-22, B102	5 Sec, 245°C
HOLT	JESD-22, A108	1000 Hrs, Bias @ T_j=125°C
PCT	JESD-22, A102	168 Hrs, 100%RH, 2atm, 121°C
TCT	JESD-22, A104	500 Cycles, -65°C~150°C
HBM	MIL-STD-883-3015.7	VHBM≧2KV
MM	JESD-22, A115	VMM≧200V
Latch-Up	JESD 78	10ms, 1_{tr}≧100mA

Customer Service

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Sindian Dist, Sinbei City 23146, Taiwan
Tel : 886-2-2910-3838
Fax : 886-2-2917-3838

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Test Report

No.: SHAEC25027527417 **Date:** Oct 31, 2025

Client Name: Resonac Materials (Suzhou) Co.,Ltd.

Client Address: No. 198 Xing Pu Road, Suzhou Industrial Park, China
No. 82 Xing Lin Street, Suzhou Industrial Park, China

Sample Name: Epoxy Molding Compound

Model No.: CEL-9240HF

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

SGS Job No.: SUP25-003725

Sample Receiving Date: Oct 22, 2025

Testing Period: Oct 22, 2025 ~ Oct 31, 2025

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 (PBB), Polybrominated diphenyl ethers (PBDE), Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP)	Pass
Element(s)	See Results
Halogen	See Results

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

Sue Sheng
Approved Signatory

Scan to see the report

F72D77CF

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Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

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检验检测专用章 Inspection & Testing Services
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中国·上海·徐汇区宜山路889号3号楼 邮编: 200233
t E&E (86–21) 61402553 f E&E (86–21)64953679 www.sgsgroup.com.cn
t HL (86–21) 61402594 f HL (86–21)61156899 sgs.china@sgs.com

Test Result(s):

Test Part Description：

SN ID	Sample No.	SGS Sample ID	Description
SN1	A4	SHA25-0275274-0001.C004	Black solid

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 (PBB), Polybrominated diphenyl ethers (PBDE), 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/AAS, UV-Vis and GC-MS.

Test Item(s)	Limit	Unit(s)	MDL	A4
Lead (Pb)	1000	mg/kg	2	ND
Mercury (Hg)	1000	mg/kg	2	ND
Cadmium (Cd)	100	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))	1000	mg/kg	8	ND
Polybromobiphenyl (PBB)	1000	mg/kg	-	ND
Monobrominated biphenyl (MonoBB)	-	mg/kg	5	ND
Dibrominated biphenyl (DiBB)	-	mg/kg	5	ND
Tribrominated biphenyl (TriBB)	-	mg/kg	5	ND
Tetrabrominated biphenyl (TetraBB)	-	mg/kg	5	ND
Pentabrominated biphenyl (PentaBB)	-	mg/kg	5	ND
Hexabrominated biphenyl (HexaBB)	-	mg/kg	5	ND
Heptabrominated biphenyl (HeptaBB)	-	mg/kg	5	ND
Octabrominated biphenyl (OctaBB)	-	mg/kg	5	ND
Nonabrominated biphenyl (NonaBB)	-	mg/kg	5	ND
Decabrominated biphenyl (DecaBB)	-	mg/kg	5	ND
Polybromodiphenyl ether(PBDE)	1000	mg/kg	-	ND
Monobrominated diphenyl ether (MonoBDE)	-	mg/kg	5	ND
Dibrominated diphenyl ether (DiBDE)	-	mg/kg	5	ND
Tribrominated diphenyl ether (TriBDE)	-	mg/kg	5	ND
Tetrabrominated diphenyl ether (TetraBDE)	-	mg/kg	5	ND
Pentabrominated diphenyl ether (PentaBDE)	-	mg/kg	5	ND
Hexabrominated diphenyl ether (HexaBDE)	-	mg/kg	5	ND
Heptabrominated diphenyl ether (HeptaBDE)	-	mg/kg	5	ND

检验检测专用章 Inspection & Testing Services
SGS-CSTC Standards Technical Services (Shanghai) Co.,Ltd. Chemical Laboratory

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Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

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中国·上海·徐汇区宜山路889号3号楼 邮编: 200233 t HL (86-21) 61402594 f HL (86-21)61156899 sgs.china@sgs.com

Test Item(s)	Limit	Unit(s)	MDL	A4
Octabrominated diphenyl ether (OctaBDE)	-	mg/kg	5	ND
Nonabrominated diphenyl ether (NonaBDE)	-	mg/kg	5	ND
Decabrominated diphenyl ether (DecaBDE)	-	mg/kg	5	ND
Bis(2-ethylhexyl) phthalate (DEHP)	1000	mg/kg	50	ND
Butyl benzyl phthalate (BBP)	1000	mg/kg	50	ND
Dibutyl phthalate (DBP)	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.

Element(s)

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

Test Item(s)	Unit(s)	MDL	A4
Antimony(Sb)	mg/kg	10	ND
Antimony Trioxide(Sb_2O_3) ◆	mg/kg	12	ND

Notes:
(1) ◆Sb_2O_3 : Calculate from Antimony content.

Halogen

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

Test Item(s)	Unit(s)	MDL	A4
Fluorine(F)	mg/kg	20	ND
Chlorine(Cl)	mg/kg	50	ND
Bromine(Br)	mg/kg	50	ND
Iodine(I)	mg/kg	50	ND

Unless otherwise stated, the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule (*w*=0) stated in ILAC-G8:09/2019.

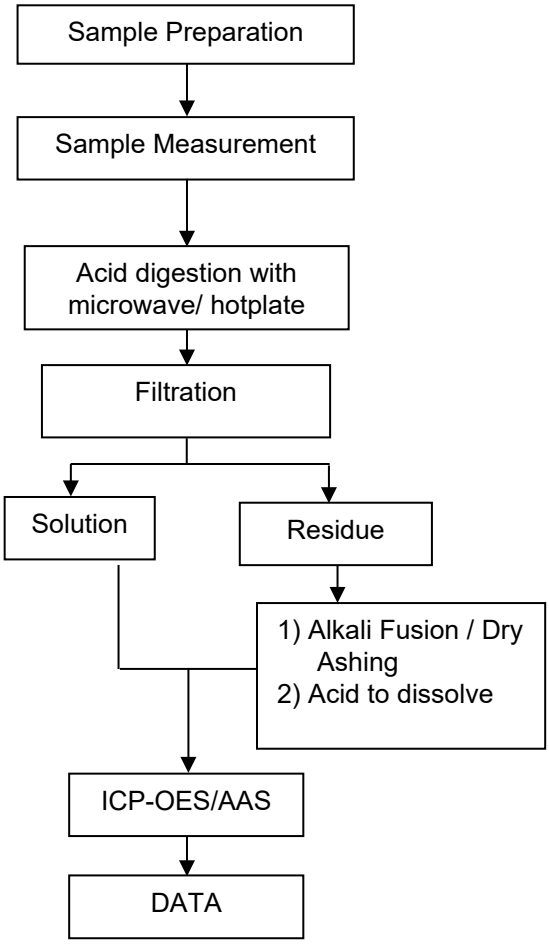
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Elements Testing Flow Chart

Name of the person who made testing: Meria Jin/Sielina Song
Name of the person in charge of testing: John Cheng
These samples were dissolved totally by pre-conditioning method according to below flow chart.



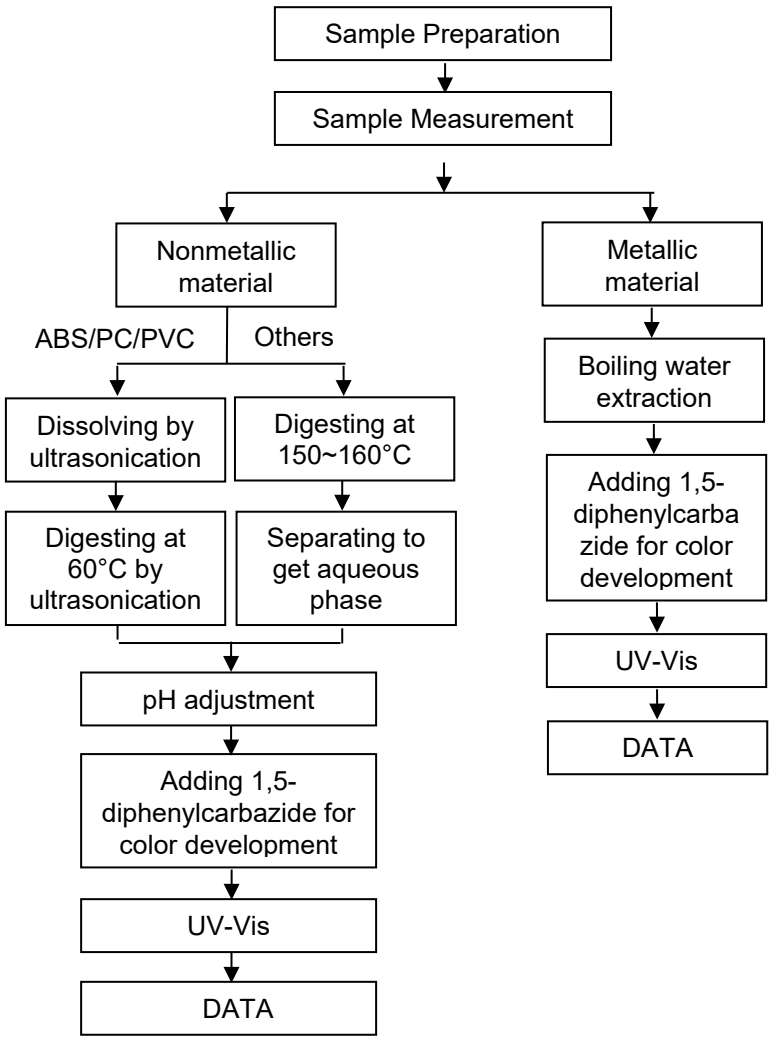
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Hexavalent Chromium (Cr(VI)) Testing Flow Chart

Name of the person who made testing: Alex Wang
Name of the person in charge of testing: Xiaolong Yang



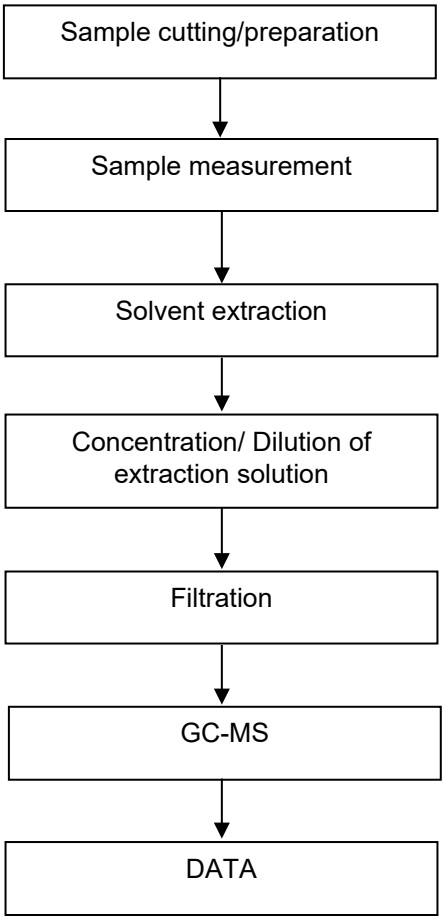
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PBB(s)/PBDE(s) Testing Flow Chart

Name of the person who made testing: Gary Xu
Name of the person in charge of testing: Carol Cui



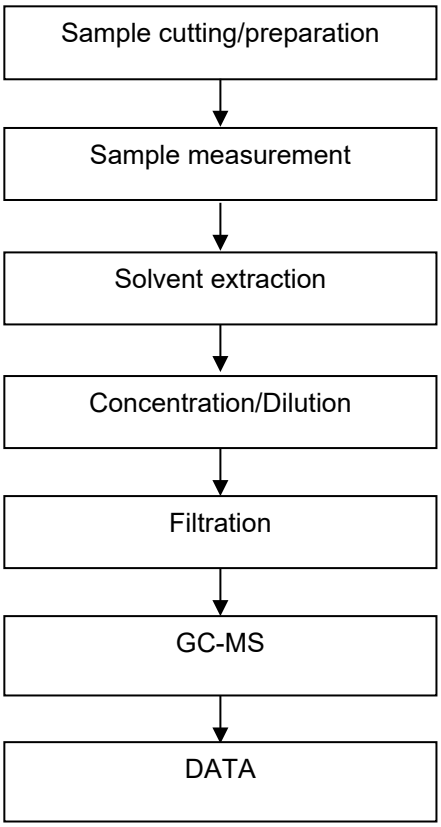
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Phthalates Testing Flow Chart

Name of the person who made testing: xiaoqiang zhang
Name of the person in charge of testing: Carol Cui



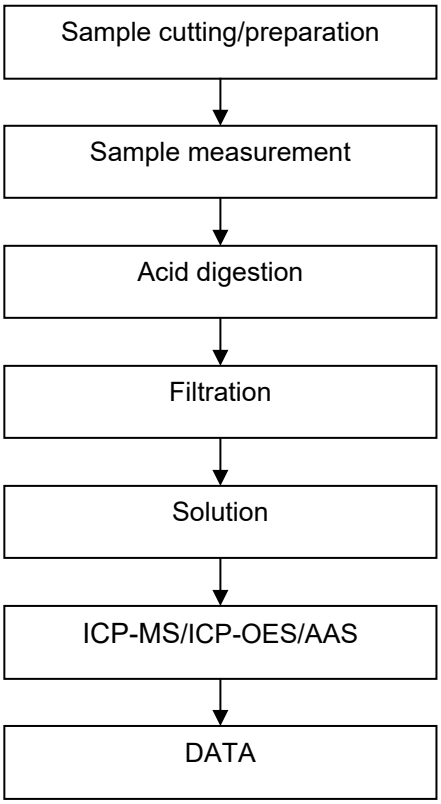
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Elements Testing Flow Chart

Name of the person who made testing: Meria Jin/Sielina Song
Name of the person in charge of testing: Carey Shan



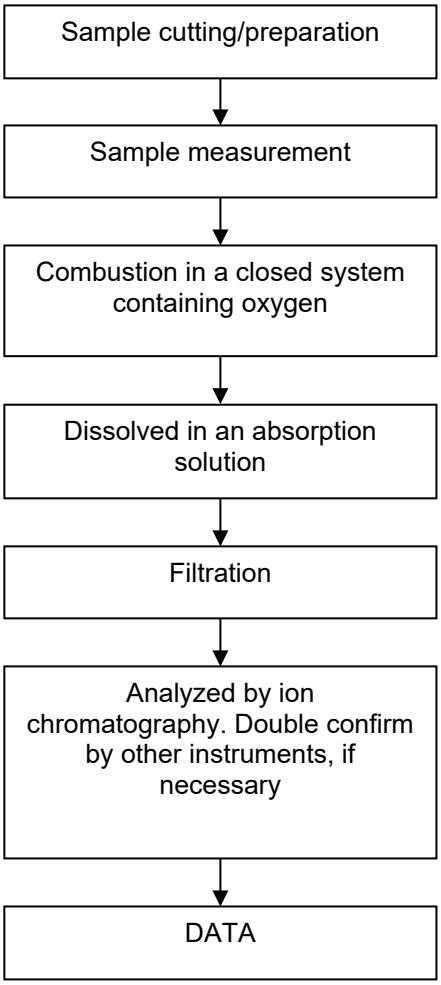
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Halogen Testing Flow Chart

Name of the person who made testing: Andy Zhang
Name of the person in charge of testing: Jinjing Sun



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Sample Photo:



SHA25-0275274-0001.C004

SGS authenticate the photo on original report only

*** End of Report ***

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Test Report

No.: SHAEC25029078049 **Date:** Nov 18, 2025

Client Name: HENKEL CORPORATION

Client Address: 14000 Jamboree Road, Irvine, CA 92606

Sample Name: 2025DSI

Style/Item No.: 2025DSI

Sample Description: Adhesive

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

SGS Job No.: SHP25-036817

Sample Receiving Date: Nov 05, 2025

Testing Period: Nov 05, 2025 ~ Nov 18, 2025

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

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

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

Test Requested	Conclusion
EU RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU- Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBB), Polybrominated diphenyl ethers (PBDE), Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP)	Pass
Other items : - Halogen - Perfluorooctanoic acid (PFOA) and its salts, Perfluorooctane sulfonic acid (PFOS) and its derivatives	See Results

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

Sue Sheng
Approved Signatory

Scan to see the report

4CEEF0CE

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Test Result(s):

Test Part Description:

SN ID	Sample No.	SGS Sample ID	Description
SN1	A1	SHA25-0290780-0001.C001	Red paste

Remarks:

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

Test Item(s)	Method	Unit	MDL	Result	Limit
				A1	
Cadmium(Cd)	With reference to IEC 62321-5:2013, analysis was performed by ICP-OES.	mg/kg	2	ND	100
Lead(Pb)	With reference to IEC 62321-5:2013, analysis was performed by ICP-OES.	mg/kg	2	ND	1000
Mercury(Hg)	With reference to IEC 62321-4:2013+AMD1:2017, analysis was performed by ICP-OES.	mg/kg	2	ND	1000
Hexavalent Chromium(Cr(VI))	With reference to IEC 62321-7-2:2017, analysis was performed by UV-Vis.	mg/kg	8	ND	1000
Sum of PBB	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	-	ND	1000
Monobromobiphenyl	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Dibromobiphenyl	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Tribromobiphenyl	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Tetrabromobiphenyl	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Pentabromobiphenyl	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Hexabromobiphenyl	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Heptabromobiphenyl	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-

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Test Item(s)	Method	Unit	MDL	Result A1	Limit
Octabromobiphenyl	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Nonabromobiphenyl	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Decabromobiphenyl	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Sum of PBDE	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	-	ND	1000
Monobromodiphenyl ether	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Dibromodiphenyl ether	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Tribromodiphenyl ether	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Tetrabromodiphenyl ether	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Pentabromodiphenyl ether	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Hexabromodiphenyl ether	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Heptabromodiphenyl ether	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Octabromodiphenyl ether	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Nonabromodiphenyl ether	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Decabromodiphenyl ether	With reference to IEC 62321-6:2015, analysis was performed by GC-MS.	mg/kg	5	ND	-
Dibutyl phthalate (DBP)	With reference to IEC 62321-8:2017, analysis was performed by GC-MS.	mg/kg	50	ND	1000
Butyl benzyl phthalate (BBP)	With reference to IEC 62321-8:2017, analysis was performed by GC-MS.	mg/kg	50	ND	1000

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Test Item(s)	Method	Unit	MDL	Result A1	Limit
Bis (2-ethylhexyl) phthalate (DEHP)	With reference to IEC 62321-8:2017, analysis was performed by GC-MS.	mg/kg	50	ND	1000
Diisobutyl Phthalates (DIBP)	With reference to IEC 62321-8:2017, analysis was performed by GC-MS.	mg/kg	50	ND	1000

Test Item(s)	Method	Unit	MDL	Result A1	Limit
Fluorine (F)	With reference to EN 14582:2016, analysis was performed by IC.	mg/kg	50	874	-
Chlorine (Cl)	With reference to EN 14582:2016, analysis was performed by IC.	mg/kg	50	ND	-
Bromine (Br)	With reference to EN 14582:2016, analysis was performed by IC.	mg/kg	50	ND	-
Iodine (I)	With reference to EN 14582:2016, analysis was performed by IC.	mg/kg	50	ND	-
Perfluorooctane sulfonic acid (PFOS), its salts^	Modified EN 17681-1:2022, analysis was performed by LC-MS or LC-MS/MS.	mg/kg	0.01	ND	-
Perfluorooctane Sulfonamide (PFOSA), its salts^	Modified EN 17681-1:2022, analysis was performed by LC-MS or LC-MS/MS.	mg/kg	0.01	ND	-
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol (N-MeFOSE)	Modified EN 17681-1:2022, analysis was performed by LC-MS or LC-MS/MS.	mg/kg	0.01	ND	-
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol (N-EtFOSE)	Modified EN 17681-1:2022, analysis was performed by LC-MS or LC-MS/MS.	mg/kg	0.01	ND	-
N-methylperfluoro-1-octanesulfonamide (N-MeFOSA)	Modified EN 17681-1:2022, analysis was performed by LC-MS or LC-MS/MS.	mg/kg	0.01	ND	-
N-ethylperfluoro-1-octanesulfonamide (N-EtFOSA)	Modified EN 17681-1:2022, analysis was performed by LC-MS or LC-MS/MS.	mg/kg	0.01	ND	-
Perfluorooctane sulfonamidoacetic Acid (FOSAA), its salts^	Modified EN 17681-1:2022, analysis was performed by LC-MS or LC-MS/MS.	mg/kg	0.01	ND	-
N-Methylperfluoro-1-octanesulfonamidoacetic Acid (N-MeFOSAA), its salts^	Modified EN 17681-1:2022, analysis was performed by LC-MS or LC-MS/MS.	mg/kg	0.01	ND	-
N-Ethylperfluorooctane sulfonamidoacetic Acid (N-EtFOSAA), its salts^	Modified EN 17681-1:2022, analysis was performed by LC-MS or LC-MS/MS.	mg/kg	0.01	ND	-

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Test Item(s)	Method	Unit	MDL	Result A1	Limit
Sum of Perfluorooctane sulfonic acid (PFOS) and its derivatives	Modified EN 17681-1:2022, analysis was performed by LC-MS or LC-MS/MS.	mg/kg	-	ND	-
Perfluorooctanoic acid (PFOA), its salts^	Modified EN 17681-1:2022, analysis was performed by LC-MS or LC-MS/MS.	mg/kg	0.01	ND	-

Notes:

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(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.
(4) ^=Substances refer to its salts/derivative listed in below table.

Substance Name	CAS No.
PFOS, its salts & derivatives	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1
Potassium Perfluorooctanesulfonate (PFOS-K)	2795-39-3
Perfluorooctanesulfonic acid, lithium salt (PFOS-Li)	29457-72-5
Sodium perfluorooctanesulfonate (PFOS-Na)	4021-47-0
Ammonium perfluorooctanesulfonate (PFOS-NH_4)	29081-56-9
Perfluorooctane sulfonate diethanolamine salt (PFOS-$NH_2(C_2H_4OH)_2$)	70225-14-8
Perfluorooctanesulfonic acid,tetraethylammonium salt (PFOS-$N(C_2H_5)_4$)	56773-42-3
N-decyl-N,N-dimethyldecan-1-aminium 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluorooctane-1-sulfonate (PFOS-$N(C_{10}H_{21})_2(CH_3)_2$)	251099-16-8
TetrabutylAmmonium perfluorooctanesulfonate (PFOS-$N(C_4H_9)_4$)	111873-33-7
Perfluorooctane Sulfonyl fluoride (PFOS-F)	307-35-7
Magnesium bis(heptadecafluorooctanesulphonate) (PFOS-Mg)	91036-71-4
Piperidine 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluorooctanesulfonate	71463-74-6
Perfluorooctanesulfonate	45298-90-6
Triethylammonium perfluorooctane sulfonate (PFOS-$N(C_2H_5)_3$)	54439-46-2
Tetramethylammonium perfluorooctane sulfonate (PFOS-$N(CH_3)_4$)	56773-44-5
N,N,N-Tripropylpentan-1-aminium heptadecafluorooctane-1-sulfonate (PFOS-$N(C_3H_7)_3(C_5H_{11})$)	56773-56-9
N,N-Dibutyl-N-methylbutan-1-aminium heptadecafluorooctane-1-sulfonate (PFOS-$N(C_4H_9)_3(CH_3)$)	124472-68-0
Iodonium, bis[4-(1,1-dimethylethyl)phenyl]-, salt with perfluoro-1-octanesulfonic acid (1:1)	213740-80-8
Diphenyl(2,4,6-trimethylphenyl)sulfonium perfluoro-1-octanesulfonate	258341-99-0
1-Hexadecylpyridinium perfluoro-1-octanesulfonate	334529-63-4
N,N,N-Triethyldecan-1-aminium heptadecafluorooctane-1-sulfonate	773895-92-4
Tetrabutylphosphonium perfluorooctane sulfonate (PFOS-P ($C_4H_9)_4$))	2185049-59-4
Perfluorooctanesulfonic acid diethylamine salt (PFOS-$C_4H_{11}N$)	2205029-08-7
heptyldimethyl{2-[(2-methylprop-2-enoyl)oxy]ethyl}azanium heptadecafluorooctane-1-sulfonate (PFOS-$C_{15}H_{30}NO_2$)	1203998-97-3
Perfluorooctane sulfonic anhydride (PFOSAN)	423-92-7
FOSAA, its salts	
Perfluorooctane sulfonamidoacetic Acid (FOSAA)	2806-24-8
N-[(Perfluorooctyl)sulfonyl]glycinate (FOSAA(anion))	909405-47-6
N-[(Perfluorooctyl)sulfonyl]glycine potassium salt (1:1) (FOSAA-K)	75260-69-4
N-[(Perfluorooctyl)sulfonyl]glycine sodium salt (1:1) (FOSAA-Na)	115716-87-5

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N-MeFOSAA, its salts	
N-Methylperfluoro-1-octanesulfonamidoacetic Acid (N-MeFOSAA)	2355-31-9
2-(N-Methylperfluorooctanesulfonamido)acetate (N-Me-FOSAA(anion))	909405-48-7
Potassium N-((heptadecafluorooctyl)sulphonyl)-N-methylglycinate (N-Me-FOSAA-K)	70281-93-5
N-EtFOSAA, its salts	
N-Ethylperfluorooctane sulfonamidoacetic Acid (N-EtFOSAA)	2991-50-6
Glycine, N-ethyl-N-[(heptadecafluorooctyl)sulfonyl]-, potassium salt (N-Et-FOSAA-K)	2991-51-7
2-(N-Ethyl-perfluorooctanesulfonamido)acetate (N-Et-FOSAA(anion))	909405-49-8
Ammonium 2-(N-ethylperfluorooctanesulfonamido)acetate (N-Et-FOSAA-NH_4)	2991-52-8
Sodium 2-(N-ethylperfluorooctanesulfonamido)acetate (N-Et-FOSAA-Na)	3871-50-9
PFOSA, its salts	
Perfluorooctane Sulfonamide (PFOSA)	754-91-6
Perfluorooctanesulfonamide lithium salt (1:1) (PFOSA-Li)	76752-79-9
Perfluorooctanesulfonamide Sodium salt (1:1) (PFOSA-Na)	76752-78-8
Perfluorooctanesulfonamide Potassium salt (1:1) (PFOSA-K)	76752-70-0
Perfluorooctanesulfonamide Ammonium salt (1:1) (PFOSA-NH_4)	76752-72-2
Heptadecafluorooctane-1-sulphonamide, compound with triethylamine (1:1) (PFOSA-$C_6H_{15}N$)	76752-82-4
PFOA, its salts & derivatives	
Perfluorooctanoic acid (PFOA)	335-67-1
Sodium perfluorooctanoate (PFOA-Na)	335-95-5
Potassium perfluorooctanoate (PFOA-K)	2395-00-8
Silver perfluorooctanote (PFOA-Ag)	335-93-3
Perfluorooctanoyl fluoride (PFOA-F)	335-66-0
Ammonium pentadecafluorooctanoate (APFO)	3825-26-1
Lithium perfluorooctanoate (PFOA-Li)	17125-58-5
Cobalt perfluorooctanoate (PFOA-Co)	35965-01-6
Cesium perfluorooctanoate (PFOA-Cs)	17125-60-9
Octanoic acid, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluoro-, chromium(3+) (PFOA-Cr(3+))	68141-02-6
Pentadecafluorooctanoic acid--piperazine (2/1) (PFOA-NH($C_4H_{10}N$))	423-52-9
Pentadecafluorooctanoate (anion)	45285-51-6
Perfluorooctanoic Anhydride	33496-48-9
N,N,N-Triethylethanaminium perfluorooctanoate	98241-25-9
Perfluorooctanoate N,N,N-Trimethylmethanaminium	32609-65-7
Tetrapropylammonium perfluorooctanoate	277749-00-5
Potassium pentadecafluorooctanoate--water (1/1/2) (PFOA-K(H_2O)$_2$)	98065-31-7
Perfluorooctanoic acid compd. with ethanamine (1:1) (PFOA-C_2H_7N)	1376936-03-6
Pentadecafluorooctanoic acid--pyridine (1/1) (PFOA-C_5H_5N)	95658-47-2

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pentadecafluorooctanoic acid- 1-phenylpiperazine(1:1) (PFOA-$C_{10}H_{14}N_2$)	1514-68-7
N,N,N-Trimethyloctan-1-aminium pentadecafluorooctanoate (PFOA-$C_{11}H_{26}N$)	927835-01-6

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.

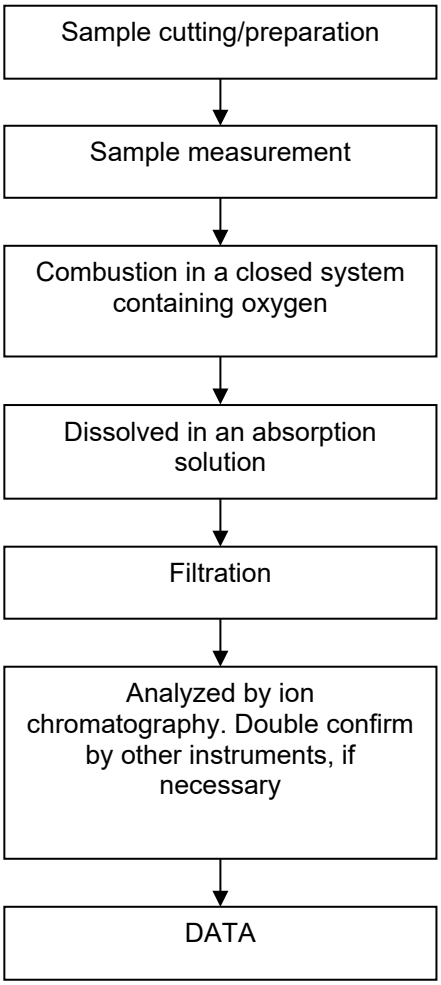
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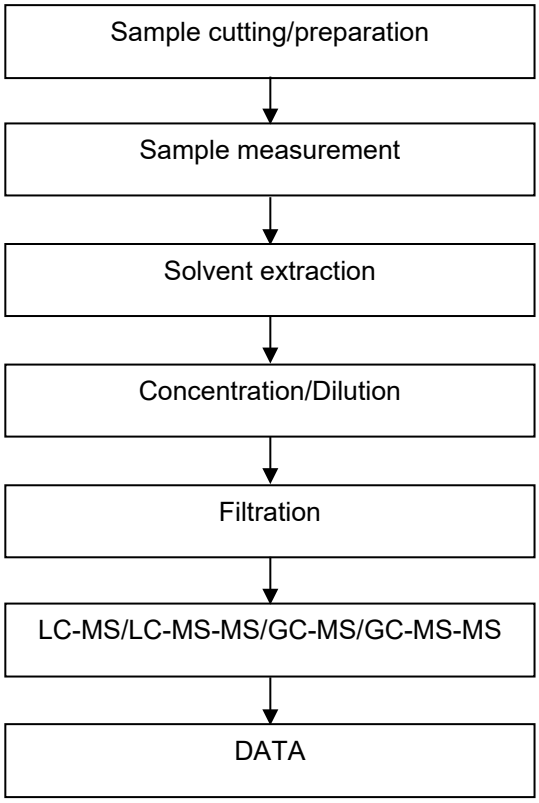
Halogen Testing Flow Chart



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PFASs/ PFOS/PFOA Testing Flow Chart

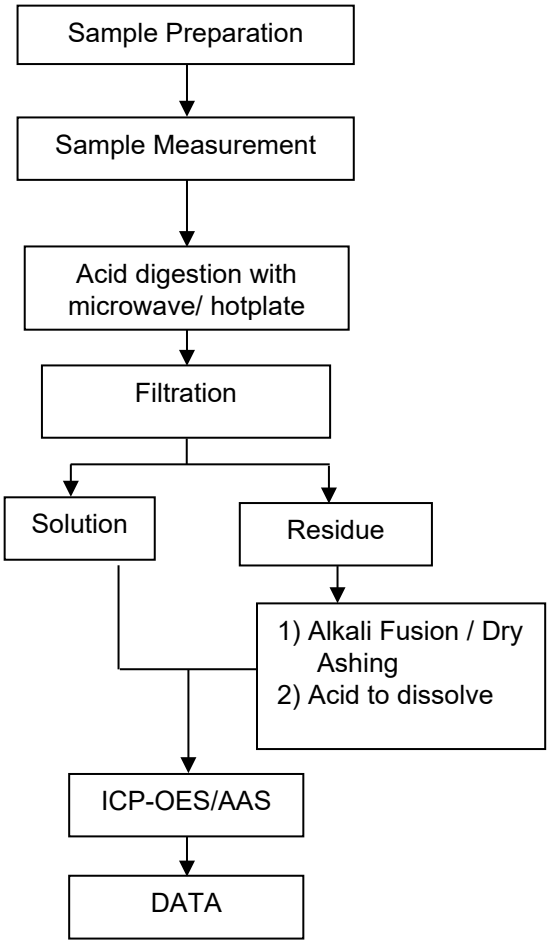


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Elements Testing Flow Chart

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

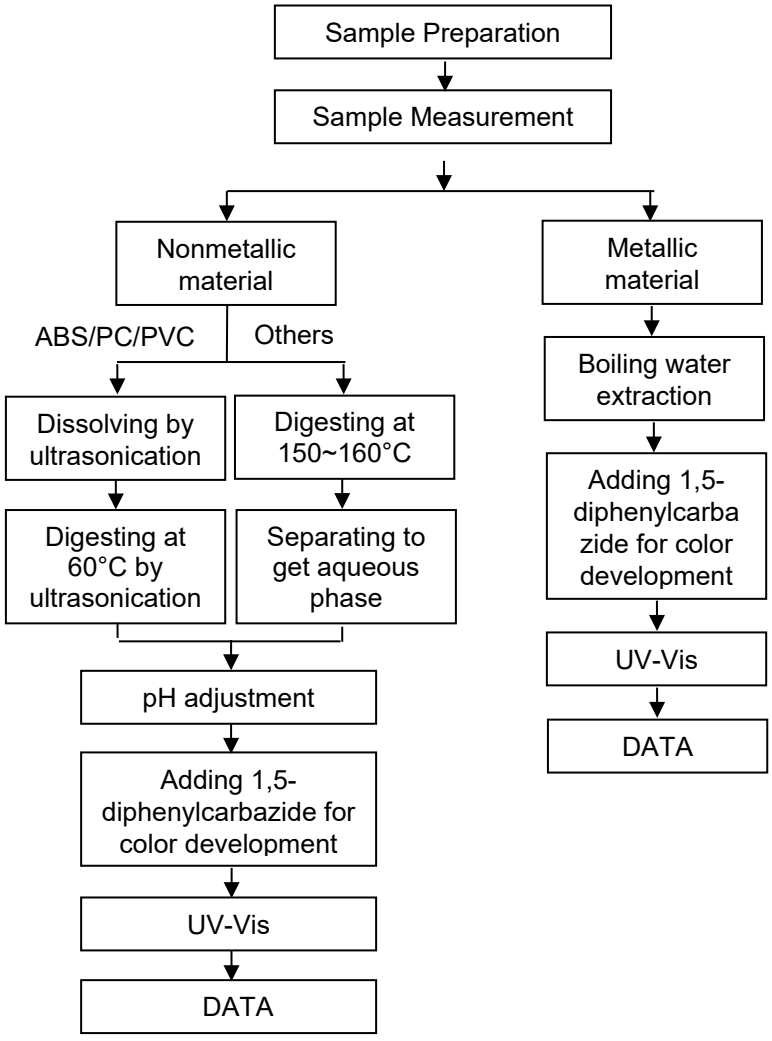


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Hexavalent Chromium (Cr(VI)) Testing Flow Chart

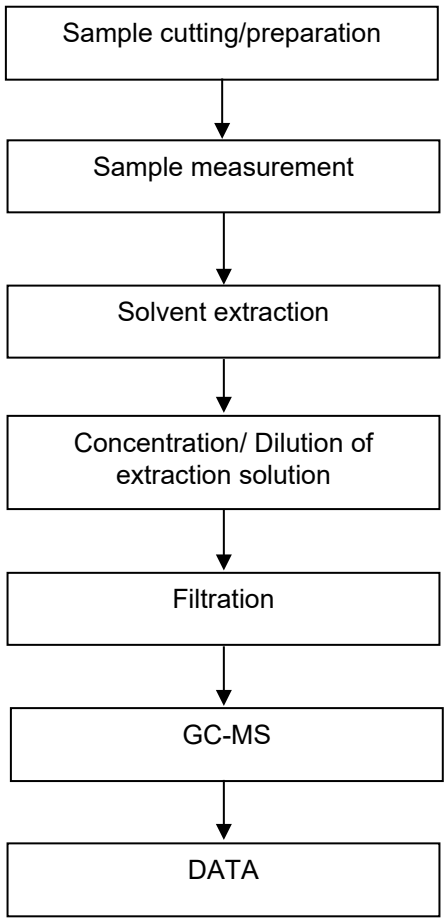


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PBB(s)/PBDE(s) Testing Flow Chart

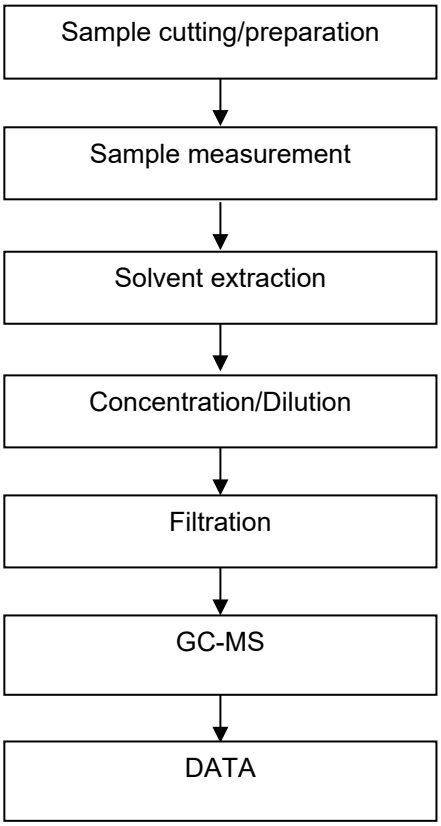


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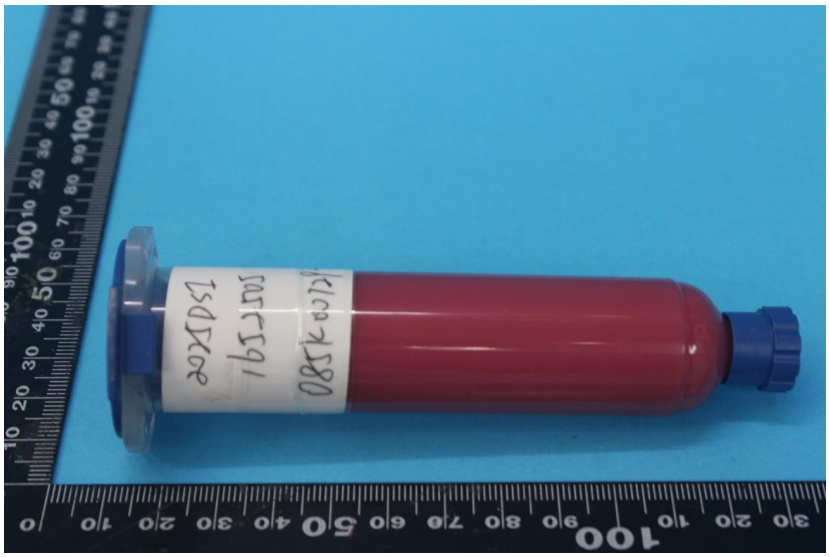
Phthalates Testing Flow Chart



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Sample Photo:



SHA25-0290780-0001.C001

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Test Report

No.: SHAEC25029078003 **Date:** Nov 18, 2025

Client Name: HENKEL CORPORATION

Client Address: 14000 Jamboree Road, Irvine, CA 92606

Sample Name: 2025DSI

Style/Item No.: 2025DSI

Sample Description: Adhesive

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

SGS Job No.: SHP25-036817

Sample Receiving Date: Nov 05, 2025

Testing Period: Nov 05, 2025 ~ Nov 18, 2025

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

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

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

Test Requested	Conclusion
Other items : - Halogen	See Results

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

Sue Sheng

Approved Signatory

Scan to see the report

93B79C0C

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Test Result(s):

Test Part Description:

SN ID	Sample No.	SGS Sample ID	Description
SN1	A1	SHA25-0290780-0001.C001	Red paste

Remarks:

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

Test Item(s)	Method	Unit	MDL	Result	Limit
				A1	
Fluorine (F)	With reference to EN 14582:2016, analysis was performed by IC.	mg/kg	50	874	-
Chlorine (Cl)	With reference to EN 14582:2016, analysis was performed by IC.	mg/kg	50	ND	-
Bromine (Br)	With reference to EN 14582:2016, analysis was performed by IC.	mg/kg	50	ND	-
Iodine (I)	With reference to EN 14582:2016, analysis was performed by IC.	mg/kg	50	ND	-

Unless otherwise stated, the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule (*w*=0) stated in ILAC-G8:09/2019.

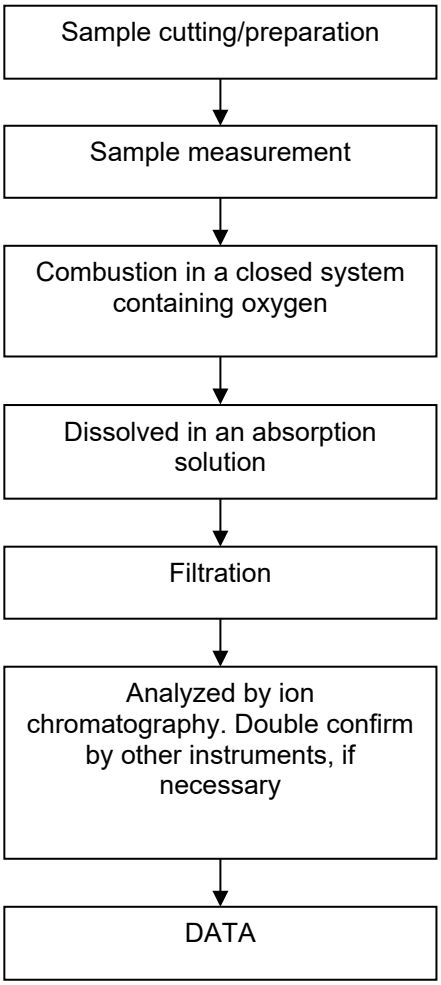
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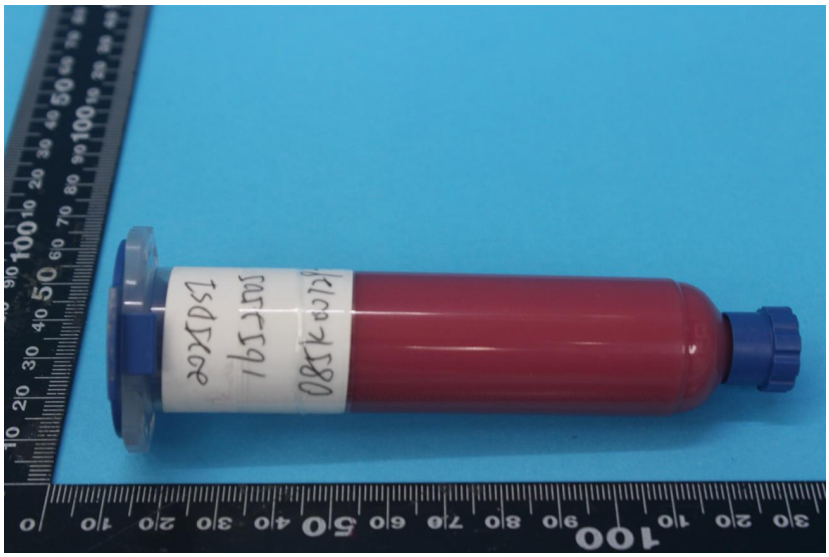
Halogen Testing Flow Chart



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Test Report No. F690101/LF-CTSAYGA25-01868

Issued Date : 2025. 05. 08

HAESUNGDS CO., LTD.
(Seongju-dong) 726 Ungnam-ro, Seongsan-gu
Changwon-si, Gyeongnam
Korea

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

SGS File No.	:	AYGA25-01868
Product Name	:	LEAD FRAME
Item No./Part No.	:	C7025_BARE
Received Date	:	2025. 04. 28
Test Period	:	2025. 04. 28 to 2025. 05. 08
Test Results	:	For further details, please refer to following page(s)

Monet Jeong

Monet Jeong

Technical Manager / SGS Korea Co., Ltd

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Sample No. : AYGA25-01868.001
Sample Description : LEAD FRAME
Item No./Part No. : C7025_BARE
Materials : Metal Alloy

Heavy Metals

Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	With reference to IEC 62321-5 : 2013, by ICP-OES	0.5	N.D.
Lead (Pb)	mg/kg	With reference to IEC 62321-5 : 2013, by ICP-OES	5	N.D.
Mercury (Hg)	mg/kg	With reference to IEC 62321-4 : 2013+AMD1:2017CSV, by ICP-OES	2	N.D.
Hexavalent Chromium (Cr VI)++	μg/cm²	With reference to IEC 62321-7-1 : 2015, by UV-Vis	0.1	N.D.

Total Metals

Test Items	Unit	Test Method	MDL	Results
Antimony (Sb)	mg/kg	With reference to EPA 3052 : 1996, EPA 6010D : 2018, by ICP-OES	10	N.D.
Arsenic (As)	mg/kg	With reference to EPA 3052 : 1996, EPA 6010D : 2018, by ICP-OES	10	N.D.
Beryllium (Be)	mg/kg	With reference to EPA 3052 : 1996, EPA 6010D : 2018, by ICP-OES	5	N.D.

Flame Retardants-PBBs/PBDEs

Test Items	Unit	Test Method	MDL	Results
Monobromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Dibromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Tribromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Tetrabromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Pentabromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Hexabromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Heptabromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Octabromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Nonabromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.

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Sample No. : AYGA25-01868.001
Sample Description : LEAD FRAME
Item No./Part No. : C7025_BARE
Materials : Metal Alloy

Flame Retardants-PBBs/PBDEs

Test Items	Unit	Test Method	MDL	Results
Decabromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Monobromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Dibromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Tribromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Tetrabromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Pentabromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Hexabromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Heptabromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Octabromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Nonabromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Decabromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.

Phthalates

Test Items	Unit	Test Method	MDL	Results
Di-isobutyl phthalate (DIBP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
Di-butyl phthalate (DBP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
Bis(2-methoxyethyl) phthalate (BMP, BMEP, DMEP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
Di-n-pentyl phthalate(DPP, DnPP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
Di-n-hexyl phthalate (DNHP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
Benzyl butyl phthalate (BBP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
[di(C6-C8 alkyl)phthalate] branched (DIHP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
Di-(2-ethylhexyl) phthalate (DEHP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
Di-n-octyl phthalate (DNOP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
Di-isononyl phthalate (DINP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
Di-isodecyl phthalate (DIDP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
[di(C7-C11 alkyl)phthalate] linear and branched (DHNUP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.

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Sample No. : AYGA25-01868.001
Sample Description : LEAD FRAME
Item No./Part No. : C7025_BARE
Materials : Metal Alloy

Chlorinated Paraffin

Test Items	Unit	Test Method	MDL	Results
Alkanes, C10~13, Short Chain Chlorinated Paraffins(SCCP)	mg/kg	With reference to ISO 18219, by CI-GC-MS	50	N.D.

Chlorinated Organic Substances

Test Items	Unit	Test Method	MDL	Results
Polychlorinated Naphthalene (PCN)	mg/kg	With reference to US EPA 8081 A(US EPA 3550C), by GC/MS	5	N.D.

PCBs & PCTs

Test Items	Unit	Test Method	MDL	Results
Polychlorinated Biphenyls (PCBs)	mg/kg	With reference to US EPA 8082,(US EPA 3550C), by GC/MS	3	N.D.
Polychlorinated terphenyls (PCTs)	mg/kg	With reference to US EPA 8082,(US EPA 3550C), by GC/MS	3	N.D.

Polymer Identification

Test Items	Unit	Test Method	MDL	Results
PVC	**	FT-IR	-	Negative

Halogen Content

Test Items	Unit	Test Method	MDL	Results
Fluorine(F)	mg/kg	With reference to BS EN 14582 : 2016, by IC	30	N.D.
Chlorine(Cl)	mg/kg	With reference to BS EN 14582 : 2016, by IC	30	N.D.
Bromine(Br)	mg/kg	With reference to BS EN 14582 : 2016, by IC	30	N.D.
Iodine(I)	mg/kg	With reference to BS EN 14582 : 2016, by IC	50	N.D.

Organotin Compounds

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Sample No. : AYGA25-01868.001
Sample Description : LEAD FRAME
Item No./Part No. : C7025_BARE
Materials : Metal Alloy

Organotin Compounds

Test Items	Unit	Test Method	MDL	Results
Dibutyltin (DBT)	mg/kg	With reference to ISO 17353:2004 , GC/MS	0.02	N.D.
Dioctyltin (DOT)	mg/kg	With reference to ISO 17353:2004 , GC/MS	0.02	N.D.
Tributyltin (TBT)	mg/kg	With reference to ISO 17353:2004 , GC/MS	0.02	N.D.
Triphenyltin (TPhT)	mg/kg	With reference to ISO 17353:2004 , GC/MS	0.02	N.D.
Tributyltin oxide (TBTO)	mg/kg	With reference to ISO 17353:2004 , GC/MS	0.02	N.D.

PFAS (Per-and polyfluoroalkyl substances)

Test Items	Unit	Test Method	MDL	Results
Perfluorootanoic acid (PFOA)	µg/kg	with reference to EN 17681-1:2022, HPLC/MS/MS	10	N.D.
Perfluorooctanesulfonic Acid (PFOS)	µg/kg	with reference to EN 17681-1:2022, HPLC/MS/MS	10	N.D.

Flame Retardants

Test Items	Unit	Test Method	MDL	Results
Hexabromocyclododecane (HBCDD)	mg/kg	With reference to USEPA 3540 C, by LC/MS	5	N.D.

Sulfur

Test Items	Unit	Test Method	MDL	Results
Sulfur	mg/kg	With reference to BS EN 14582 : 2016, by IC	30	N.D.

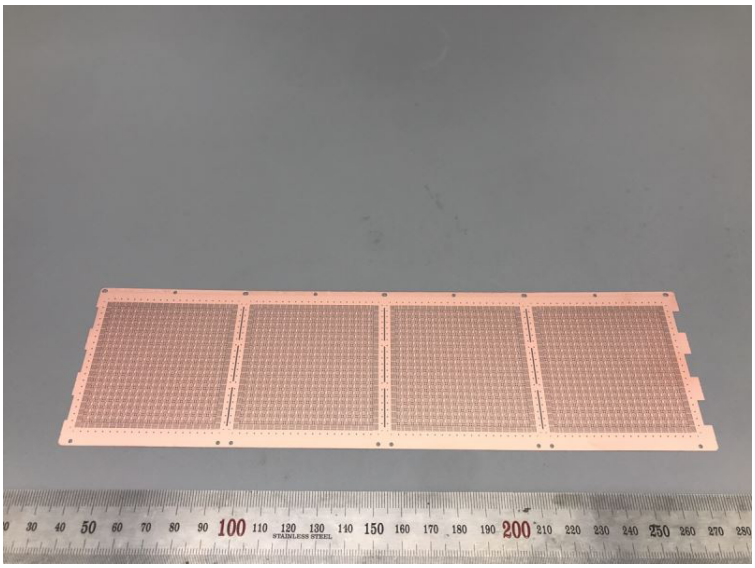
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NOTE: (1) N.D. = Not detected. (<MDL)
(2) mg/kg = ppm, ug/kg = ppb, mg/L = ppm
(3) MDL = Method Detection Limit
(4) - = No regulation
(5) ** = Qualitative analysis (No Unit)
(6) Negative = Undetectable / Positive = Detectable
(7) + = a. The result of Hexavalent Chromium (Cr(VI)) is “ND” as the result of Chromium (Cr) is “ND”, and confirmation test of Hexavalent Chromium (Cr(VI)) is not required.
b. If the content of Total Chromium (Cr) is greater than the MDL of Hexavalent Chromium (Cr(VI)), it is the result of hexavalent Chromium by UV-VIS.
(8) ++= a. The sample is positive for Cr VI if the Cr VI concentration is greater than 0.13 ug/cm2. The sample coating is considered to contain Cr VI.
b. The sample is negative for Cr VI if Cr VI is ND(concentration less than 0.10 ug/cm2). The coating is considered a non-Cr VI based coating.
c. The result between 0.10 ug/cm2 and 0.13 ug/cm2 is considered to be inconclusive – unavoidable coating variations may influence the determination.

Picture of Sample as Received:



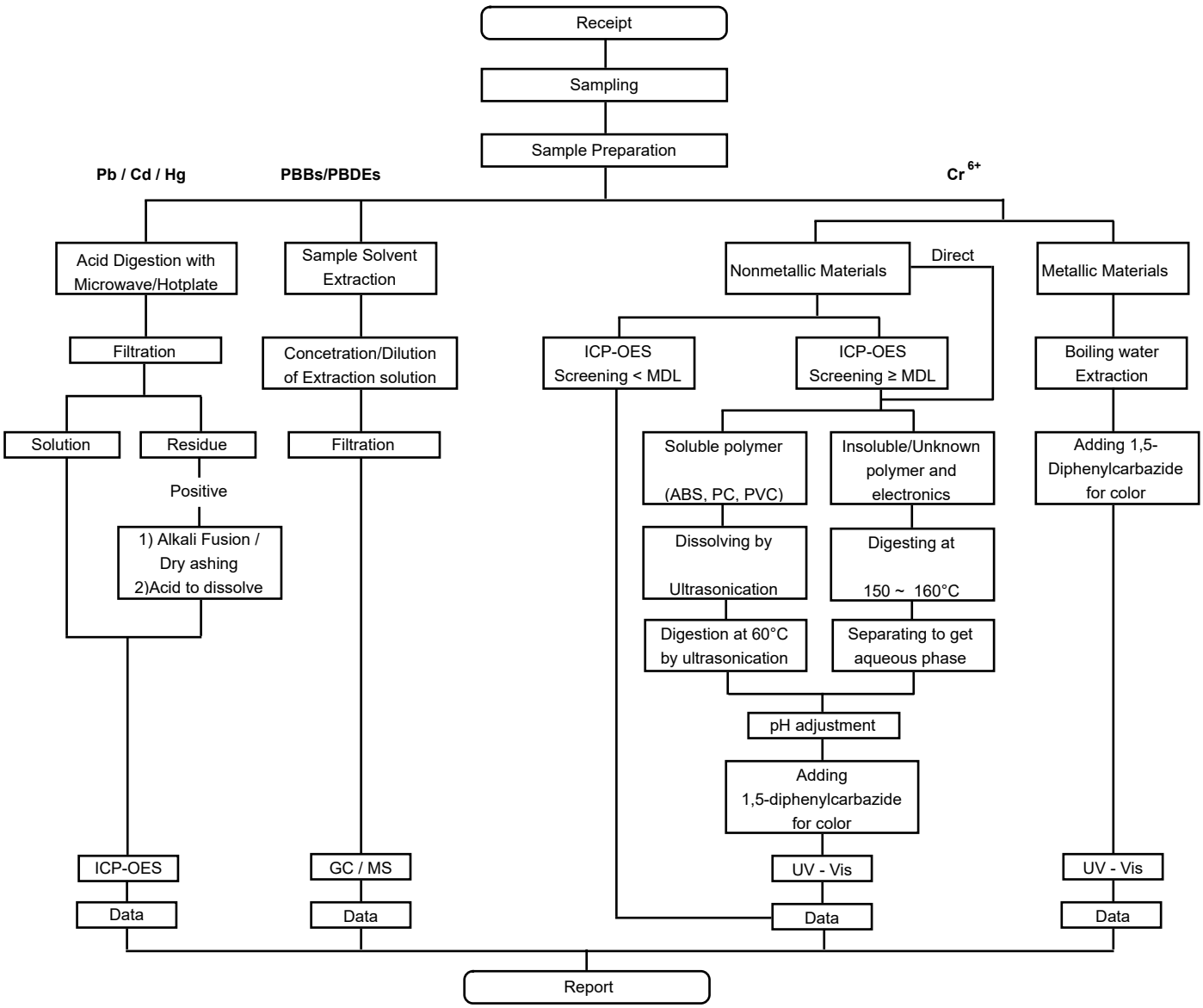
AYGA25-01868.001

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Flow Chart for RoHS Pb / Cd / Hg / Cr^{6+} / PBBs&PBDEs Test



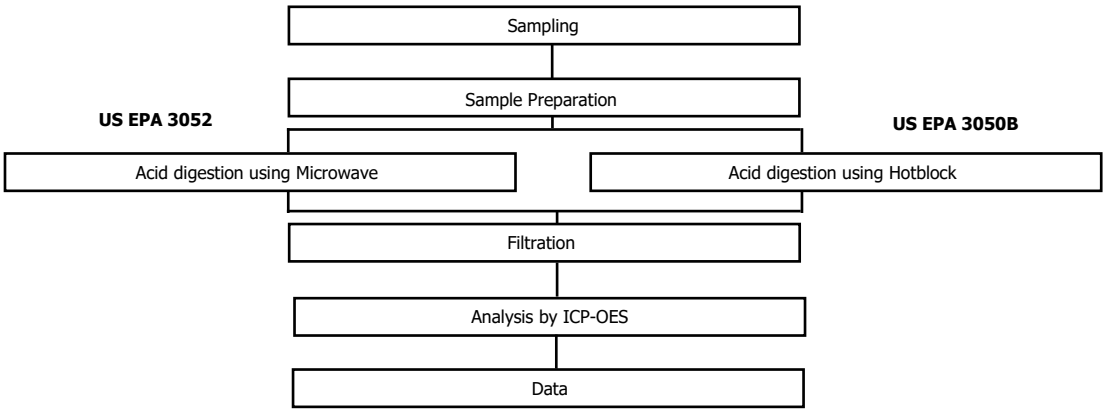
The samples were dissolved totally at the acid digestion step of the above flow chart for Cd, Pb, Hg.

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Flow Chart for Heavy metal



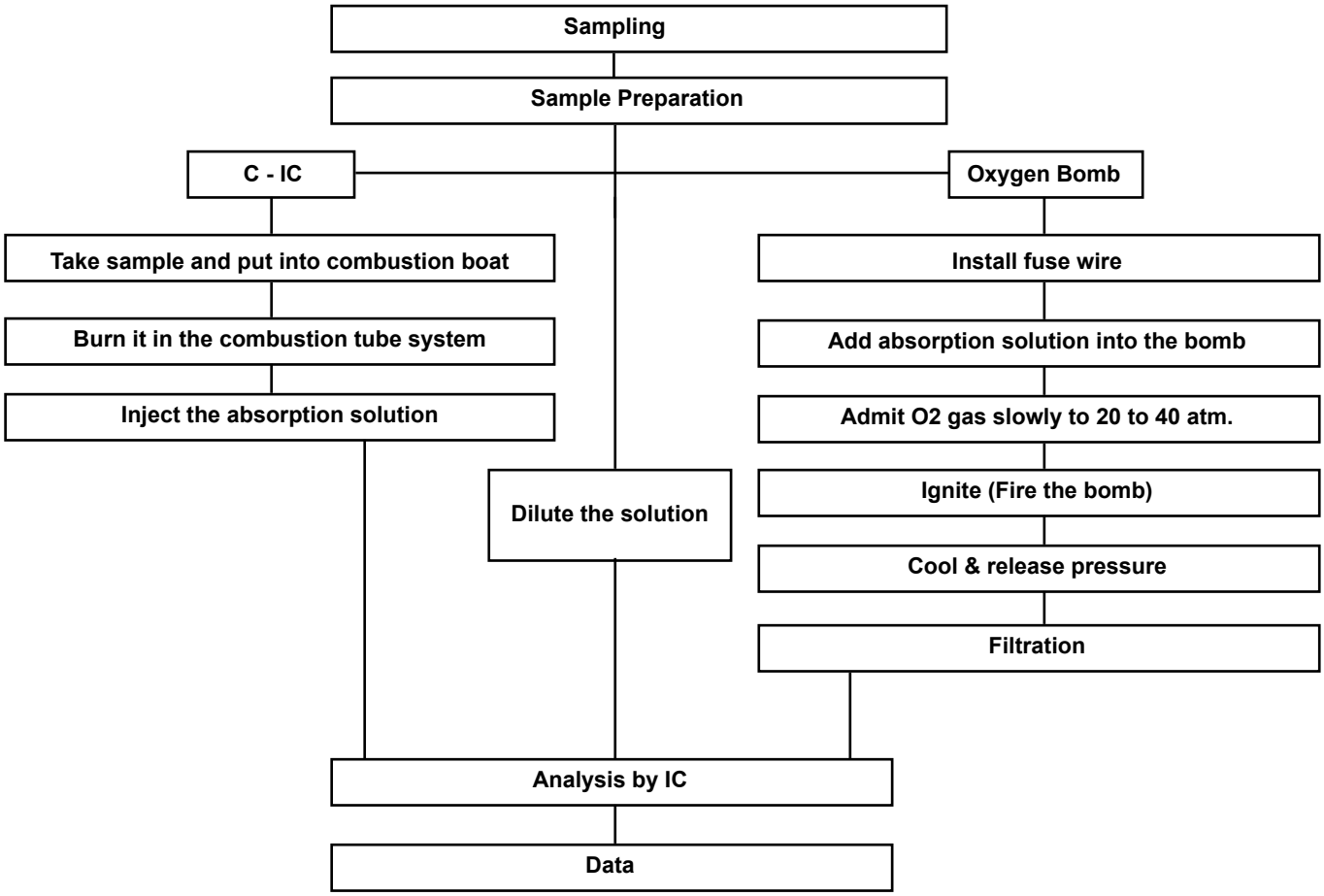
Major Inorganic Heavy Metals	Antimony(Sb) , Beryllium(Be) , Phosphorus(P) , Arsenic(As) etc.

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Flow Chart for Halogen Test

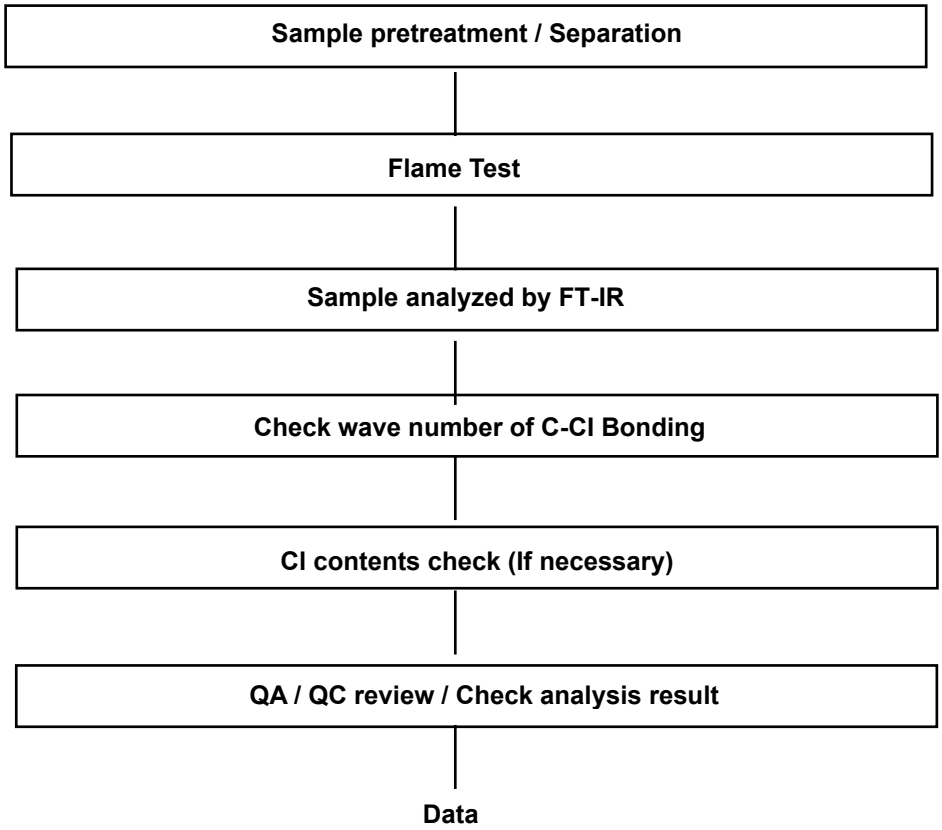


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Flow Chart for PVC Test

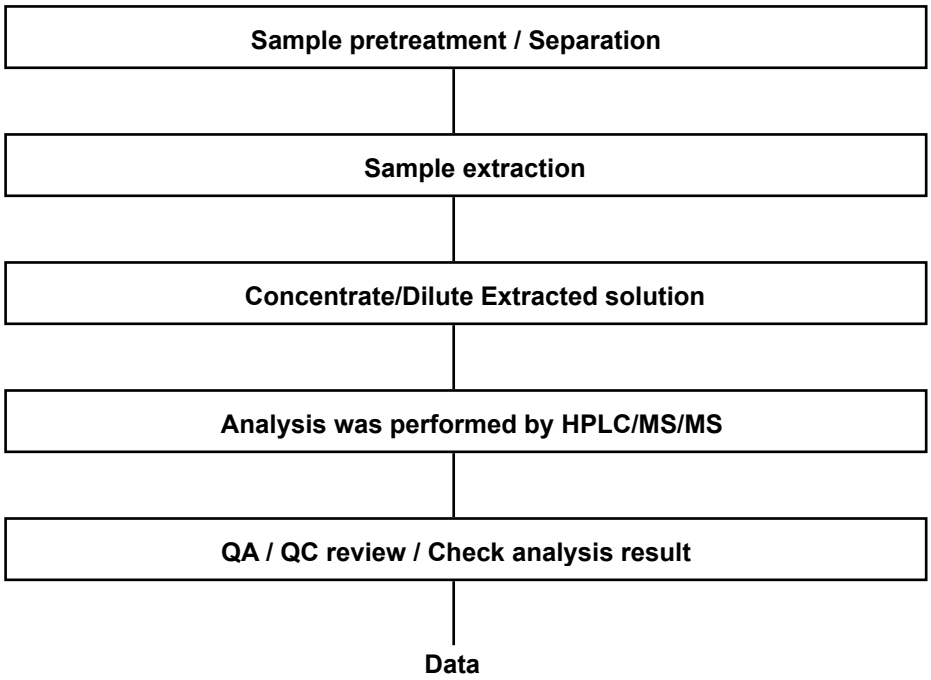


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Flow Chart for PFOS/PFOA Test

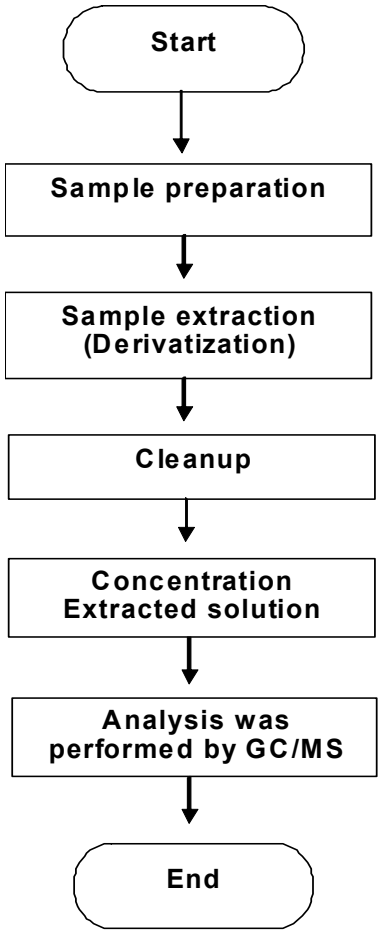


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Organotin Flow Chart

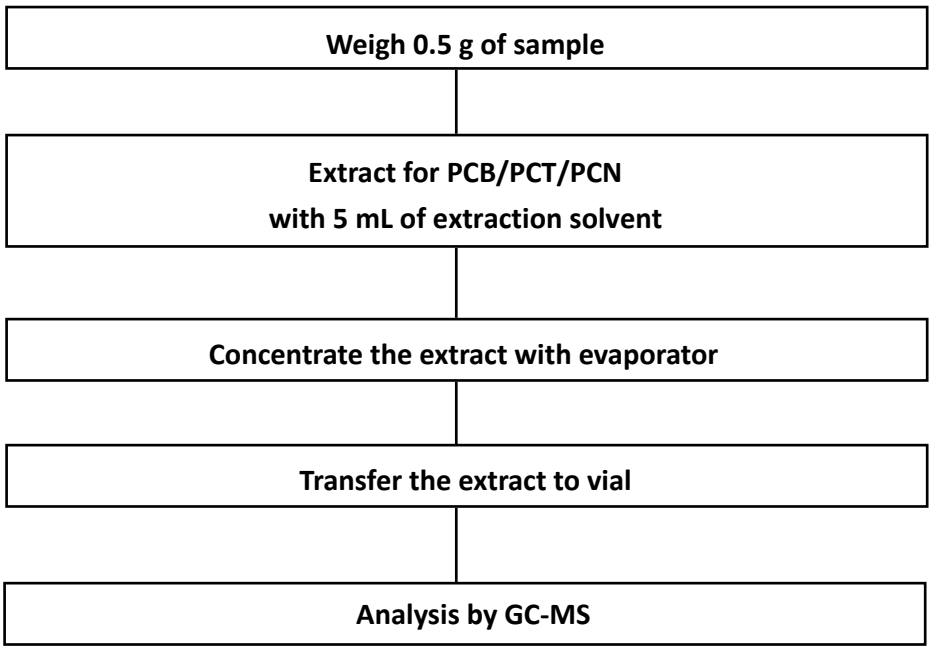


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Flow Chart for (PCB/PCT/PCN)

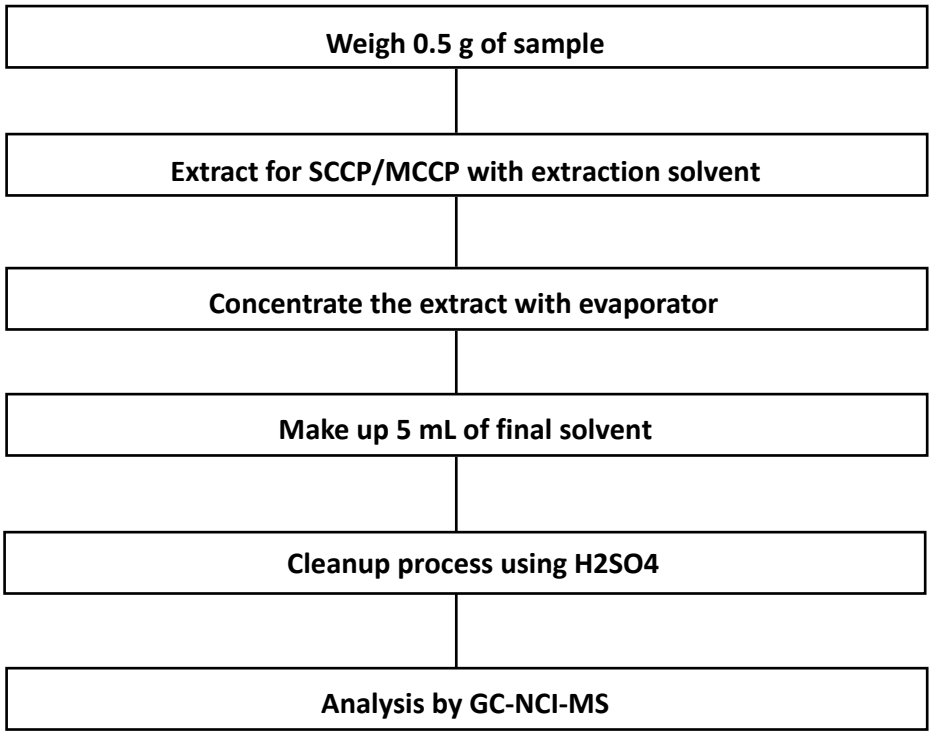


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Flow Chart for SCCP/MCCP

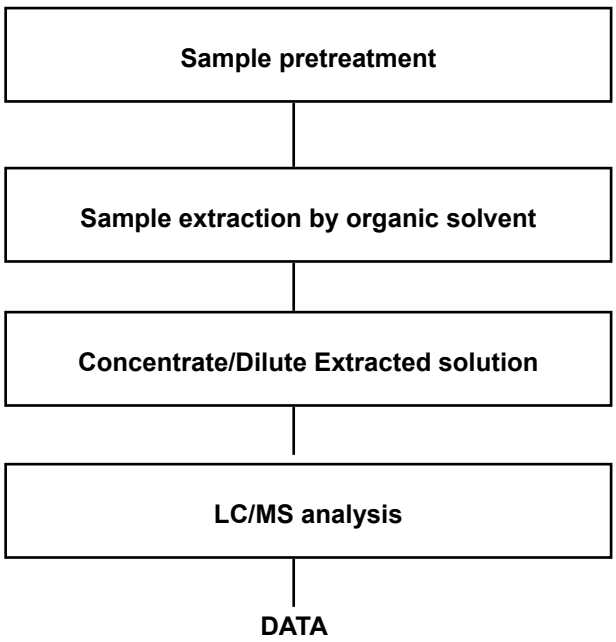


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Testing Flow Chart for HBCD

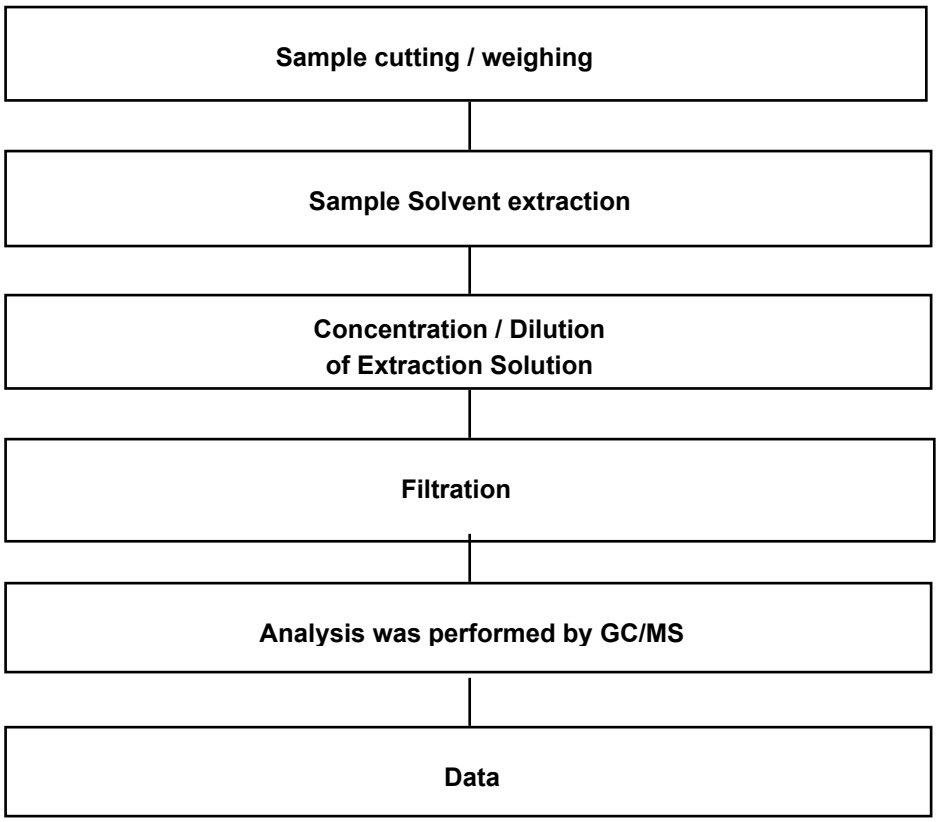


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Flow Chart for PhthalateTest



*** End of Report ***

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Test Report No. F690101/LF-CTSAYGA25-04223

Issued Date : 2025. 12. 05

HAESUNGDS CO., LTD.
(Seongju-dong) 726 Ungnam-ro, Seongsan-gu
Changwon-si, Gyeongnam
Korea

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

SGS File No.	:	AYGA25-04223
Product Name	:	Ag Plating
Item No./Part No.	:	N/A
Received Date	:	2025. 11. 17
Test Period	:	2025. 11. 17 to 2025. 12. 05
Test Results	:	For further details, please refer to following page(s)

Monet Jeong

Monet Jeong

Technical Manager / SGS Korea Co., Ltd

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Sample No. : AYGA25-04223.001
Sample Description : Ag Plating
Item No./Part No. : N/A
Materials : Metal Alloy

Heavy Metals

Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	With reference to IEC 62321-5 : 2013, by ICP-OES	0.5	N.D.
Lead (Pb)	mg/kg	With reference to IEC 62321-5 : 2013, by ICP-OES	5	20.4
Mercury (Hg)	mg/kg	With reference to IEC 62321-4 : 2013+AMD1:2017CSV, by ICP-OES	2	N.D.
Hexavalent Chromium (Cr VI)++	μg/cm²	With reference to IEC 62321-7-1 : 2015, by UV-Vis	0.1	N.D.

Total Metals

Test Items	Unit	Test Method	MDL	Results
Antimony (Sb)	mg/kg	With reference to EPA 3052: 1996 / EPA 6010D: 2018, ICP-OES	10	N.D.
Arsenic (As)	mg/kg	With reference to EPA 3052: 1996 / EPA 6010D: 2018, ICP-OES	10	N.D.
Beryllium (Be)	mg/kg	With reference to EPA 3052: 1996 / EPA 6010D: 2018, ICP-OES	5	N.D.

Flame Retardants-PBBs/PBDEs

Test Items	Unit	Test Method	MDL	Results
Monobromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Dibromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Tribromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Tetrabromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Pentabromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Hexabromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Heptabromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Octabromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Nonabromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.

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Sample No. : AYGA25-04223.001
Sample Description : Ag Plating
Item No./Part No. : N/A
Materials : Metal Alloy

Flame Retardants-PBBs/PBDEs

Test Items	Unit	Test Method	MDL	Results
Decabromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Monobromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Dibromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Tribromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Tetrabromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Pentabromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Hexabromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Heptabromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Octabromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Nonabromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Decabromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.

Phthalates

Test Items	Unit	Test Method	MDL	Results
Di-butyl phthalate (DBP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
Benzyl butyl phthalate (BBP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
Di-(2-ethylhexyl) phthalate (DEHP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
Di-isobutyl phthalate (DIBP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
[di(C6-C8 alkyl)phthalate] branched (DIHP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
[di(C7-C11 alkyl)phthalate] linear and branched (DHNUP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
Bis(2-methoxyethyl) phthalate (BMP, BMEP, DMEP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
Di-isononyl phthalate (DINP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
Di-isodecyl phthalate (DIDP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
Di-n-octyl phthalate (DNOP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
Di-n-hexyl phthalate (DNHP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
Di-n-pentyl phthalate(DPP, DnPP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.

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Sample No. : AYGA25-04223.001
Sample Description : Ag Plating
Item No./Part No. : N/A
Materials : Metal Alloy

Chlorinated Paraffin

Test Items	Unit	Test Method	MDL	Results
Alkanes, C10~13, Short Chain Chlorinated Paraffins(SCCP)	mg/kg	With reference to ISO 18219, by CI-GC-MS	50	N.D.

Chlorinated Organic Substances

Test Items	Unit	Test Method	MDL	Results
Polychlorinated Naphthalene (PCN)	mg/kg	With reference to US EPA 8081 A(US EPA 3550C), by GC/MS	5	N.D.

PCBs & PCTs

Test Items	Unit	Test Method	MDL	Results
Polychlorinated Biphenyls (PCBs)	mg/kg	With reference to US EPA 8082,(US EPA 3550C), by GC/MS	3	N.D.
Polychlorinated terphenyls (PCTs)	mg/kg	With reference to US EPA 8082,(US EPA 3550C), by GC/MS	3	N.D.

Polymer Identification

Test Items	Unit	Test Method	MDL	Results
PVC	**	FT-IR	-	Negative

Halogen Content

Test Items	Unit	Test Method	MDL	Results
Fluorine(F)	mg/kg	With reference to BS EN 14582 : 2016, by IC	30	N.D.
Chlorine(Cl)	mg/kg	With reference to BS EN 14582 : 2016, by IC	30	N.D.
Bromine(Br)	mg/kg	With reference to BS EN 14582 : 2016, by IC	30	N.D.
Iodine(I)	mg/kg	With reference to BS EN 14582 : 2016, by IC	50	N.D.

Organotin Compounds

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Sample No. : AYGA25-04223.001
Sample Description : Ag Plating
Item No./Part No. : N/A
Materials : Metal Alloy

Organotin Compounds

Test Items	Unit	Test Method	MDL	Results
Tributyltin (TBT)	mg/kg	With reference to ISO 17353:2004 , GC/MS	0.02	N.D.
Triphenyltin (TPhT)	mg/kg	With reference to ISO 17353:2004 , GC/MS	0.02	N.D.
Dibutyltin (DBT)	mg/kg	With reference to ISO 17353:2004 , GC/MS	0.02	N.D.
Dioctyltin (DOT)	mg/kg	With reference to ISO 17353:2004 , GC/MS	0.02	N.D.
Tributyltin oxide (TBTO)	mg/kg	With reference to ISO 17353:2004 , GC/MS	0.02	N.D.

PFAS (Per-and polyfluoroalkyl substances)

Test Items	Unit	Test Method	MDL	Results
Perfluorootanoic acid (PFOA)	µg/kg	With reference to EN 17681-1:2025, HPLC-MS-MS/GC-MS	10	N.D.
Perfluorooctanesulfonic Acid (PFOS)	µg/kg	With reference to EN 17681-1:2025, HPLC-MS-MS/GC-MS	10	N.D.

Flame Retardants

Test Items	Unit	Test Method	MDL	Results
Hexabromocyclododecane (HBCDD)	mg/kg	With reference to EPA 3540C, LC/MS	5	N.D.

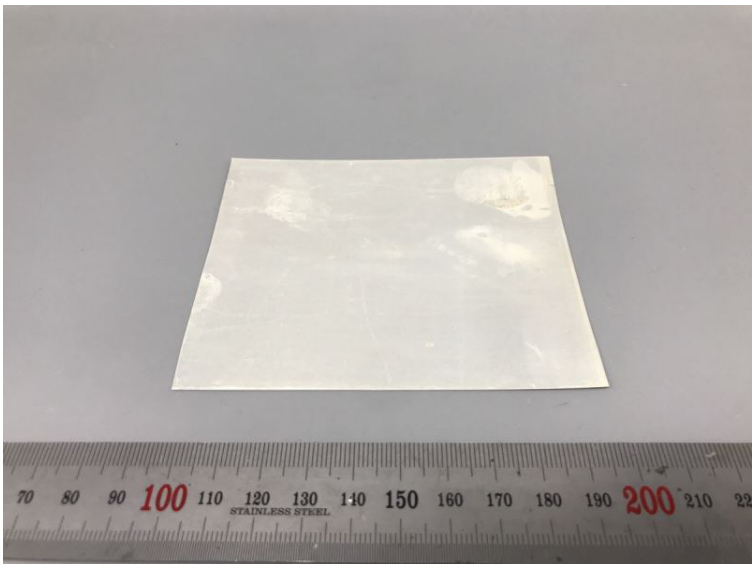
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NOTE:
(1) N.D. = Not detected. (<MDL)
(2) mg/kg = ppm, ug/kg = ppb, mg/L = ppm
(3) MDL = Method Detection Limit
(4) - = No regulation
(5) ** = Qualitative analysis (No Unit)
(6) Negative = Undetectable / Positive = Detectable
(7) + = a. The result of Hexavalent Chromium (Cr(VI)) is “ND” as the result of Chromium (Cr) is “ND”, and confirmation test of Hexavalent Chromium (Cr(VI)) is not required.
b. If the content of Total Chromium (Cr) is greater than the MDL of Hexavalent Chromium (Cr(VI)), it is the result of hexavalent Chromium by UV-VIS.
(8) ++= a. The sample is positive for Cr VI if the Cr VI concentration is greater than 0.13 ug/cm2. The sample coating is considered to contain Cr VI.
b. The sample is negative for Cr VI if Cr VI is ND(concentration less than 0.10 ug/cm2). The coating is considered a non-Cr VI based coating.
c. The result between 0.10 ug/cm2 and 0.13 ug/cm2 is considered to be inconclusive – unavoidable coating variations may influence the determination.

Picture of Sample as Received:



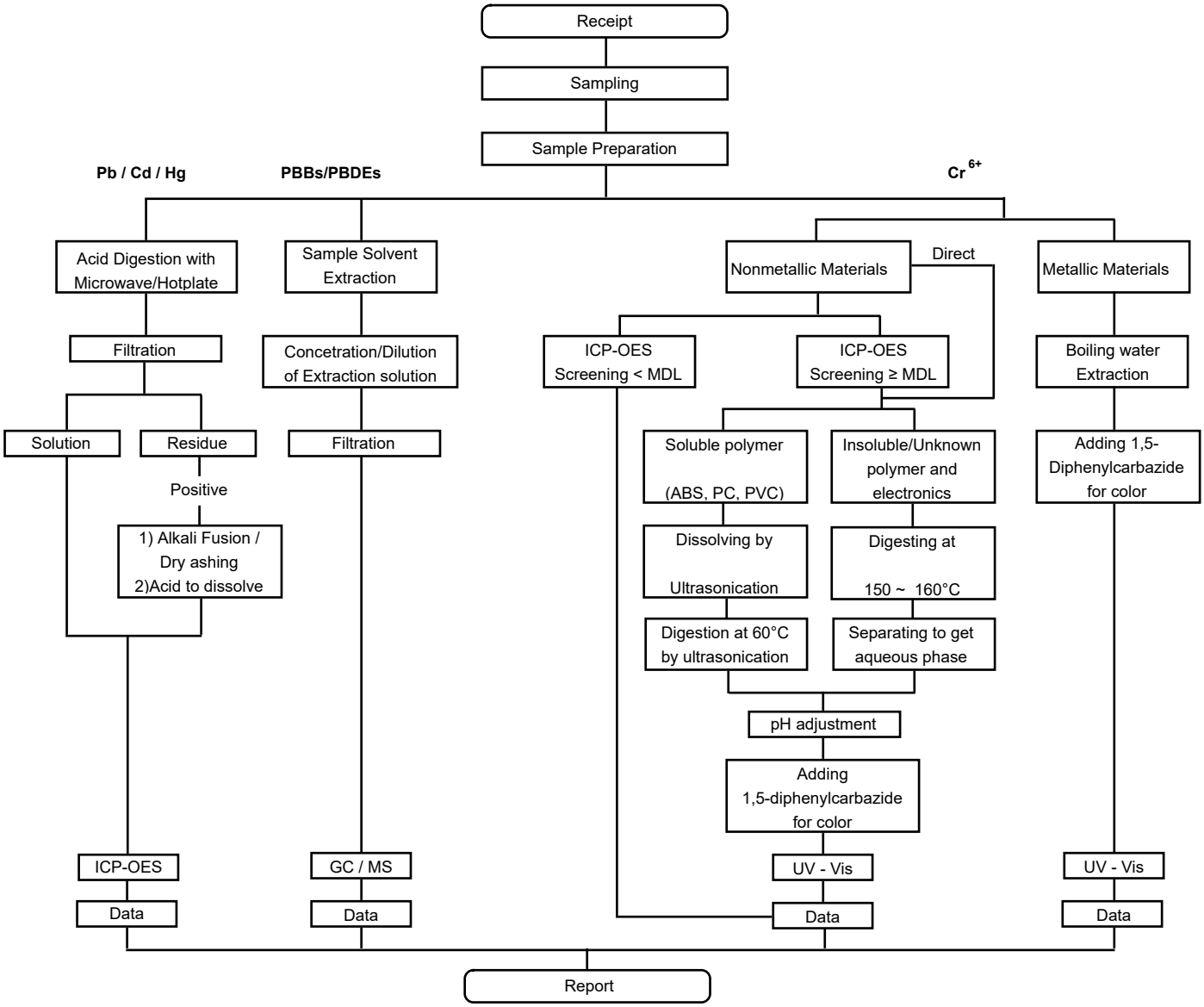
AYGA25-04223.001

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Flow Chart for RoHS Pb / Cd / Hg / Cr^{6+} / PBBs&PBDEs Test



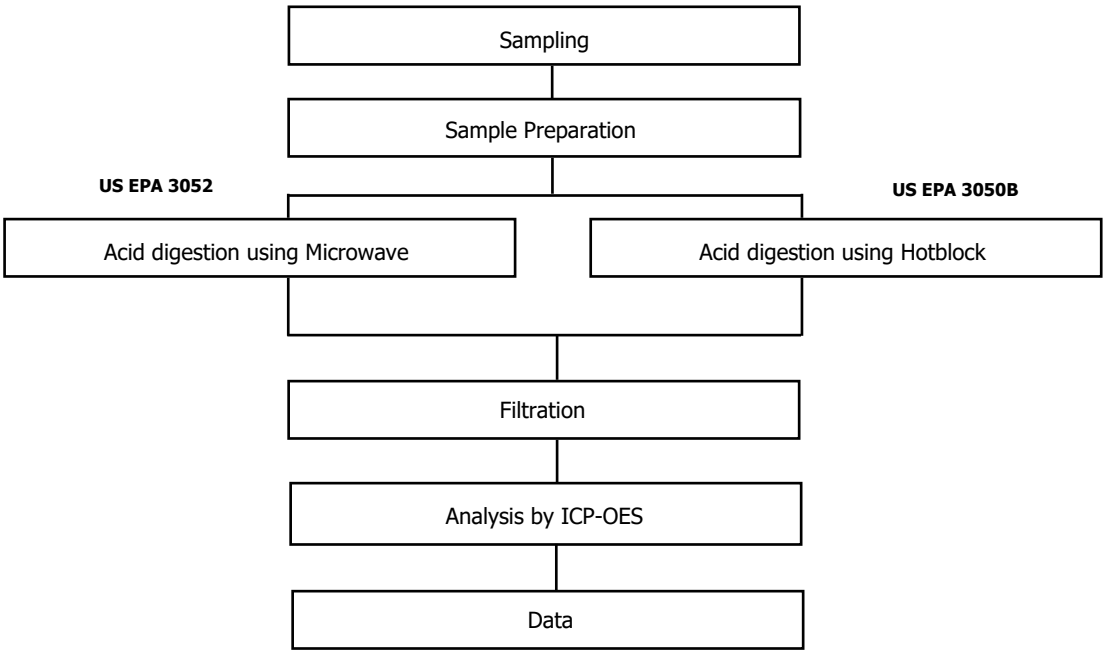
The samples were dissolved totally at the acid digestion step of the above flow chart for Cd, Pb, Hg.

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Flow Chart for Heavy metal



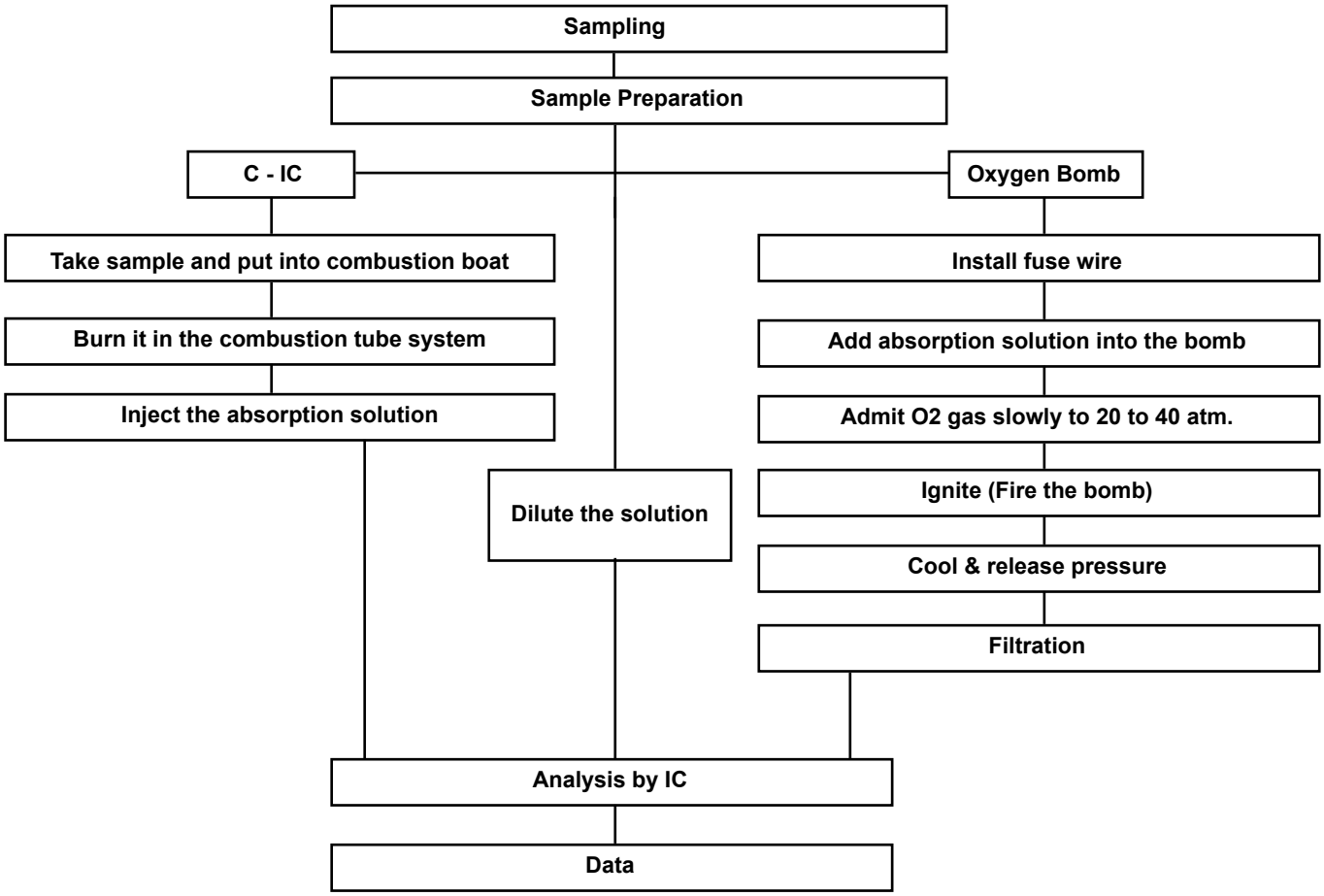
Major Inorganic Heavy Metals	Antimony(Sb) , Beryllium(Be) , Phosphorus(P) , Arsenic(As) etc.

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Flow Chart for Halogen Test

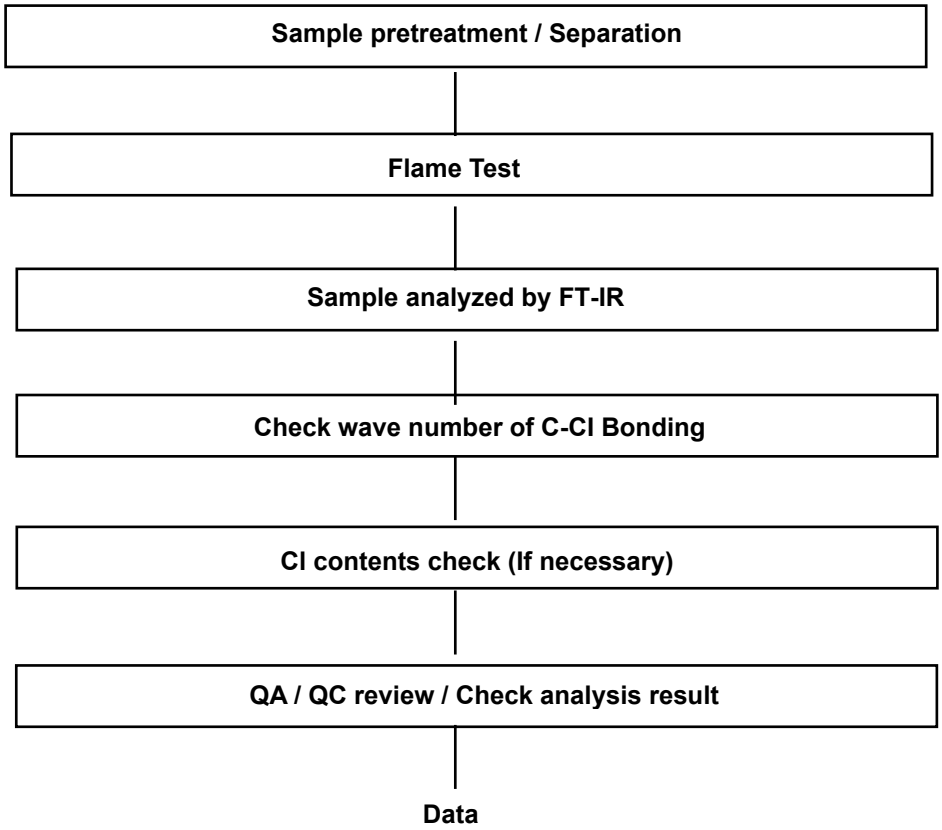


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Flow Chart for PVC Test

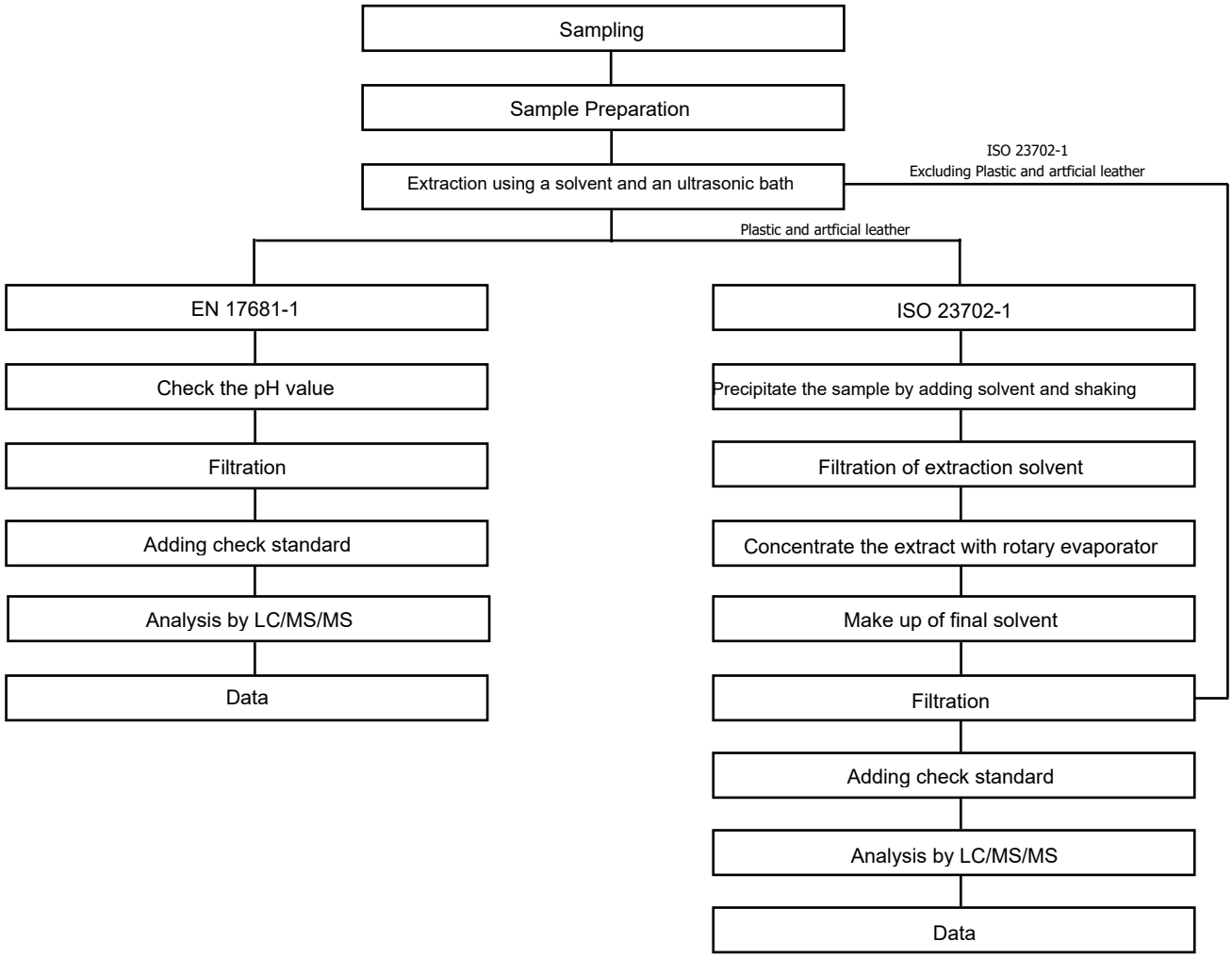


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Flow Chart for PFAS
(All material)

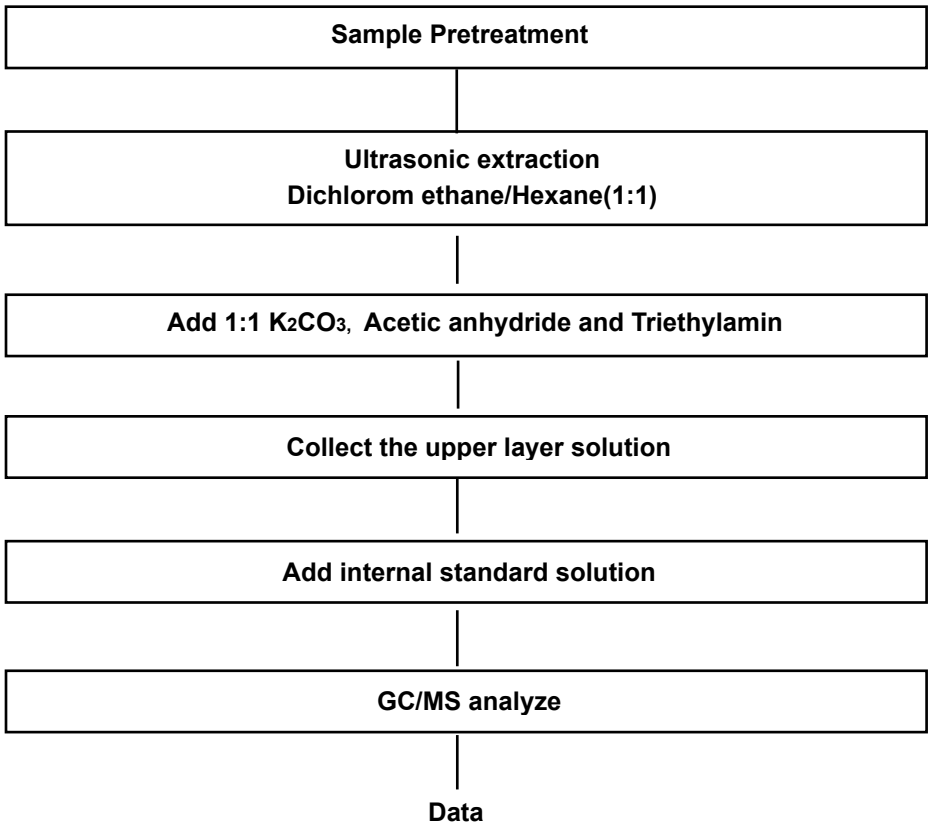


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Flow Chart for TBBPA Test

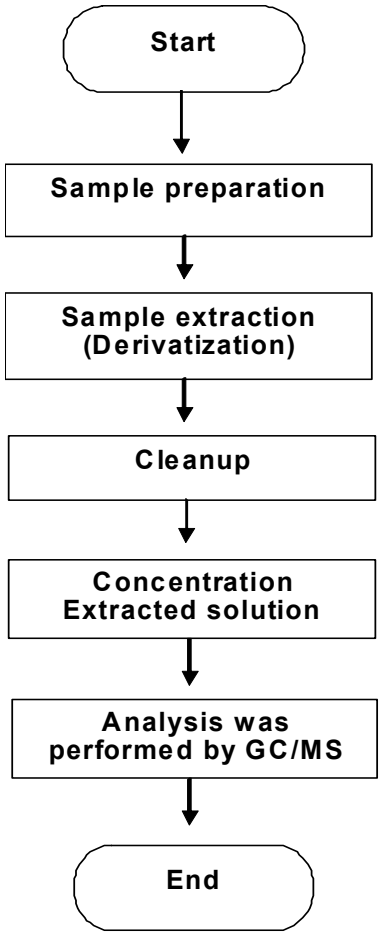


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Organotin Flow Chart

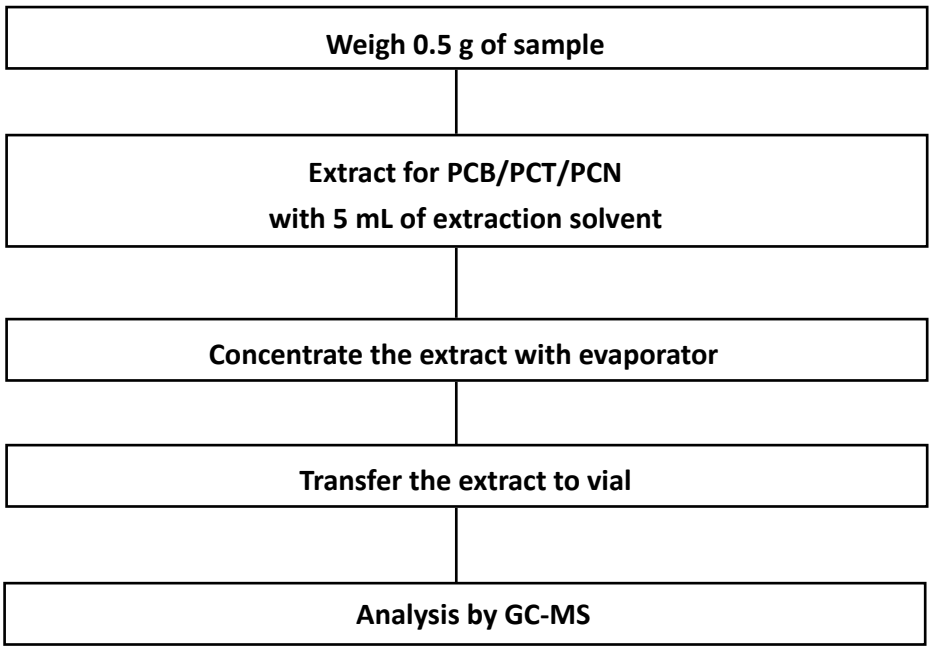


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Flow Chart for (PCB/PCT/PCN)

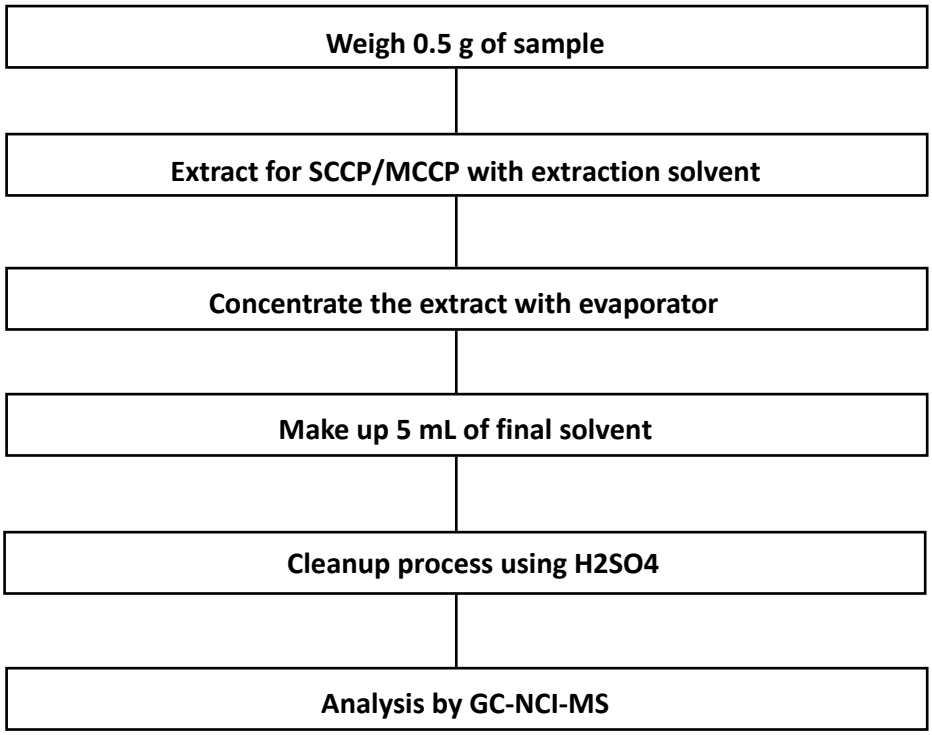


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Flow Chart for SCCP/MCCP

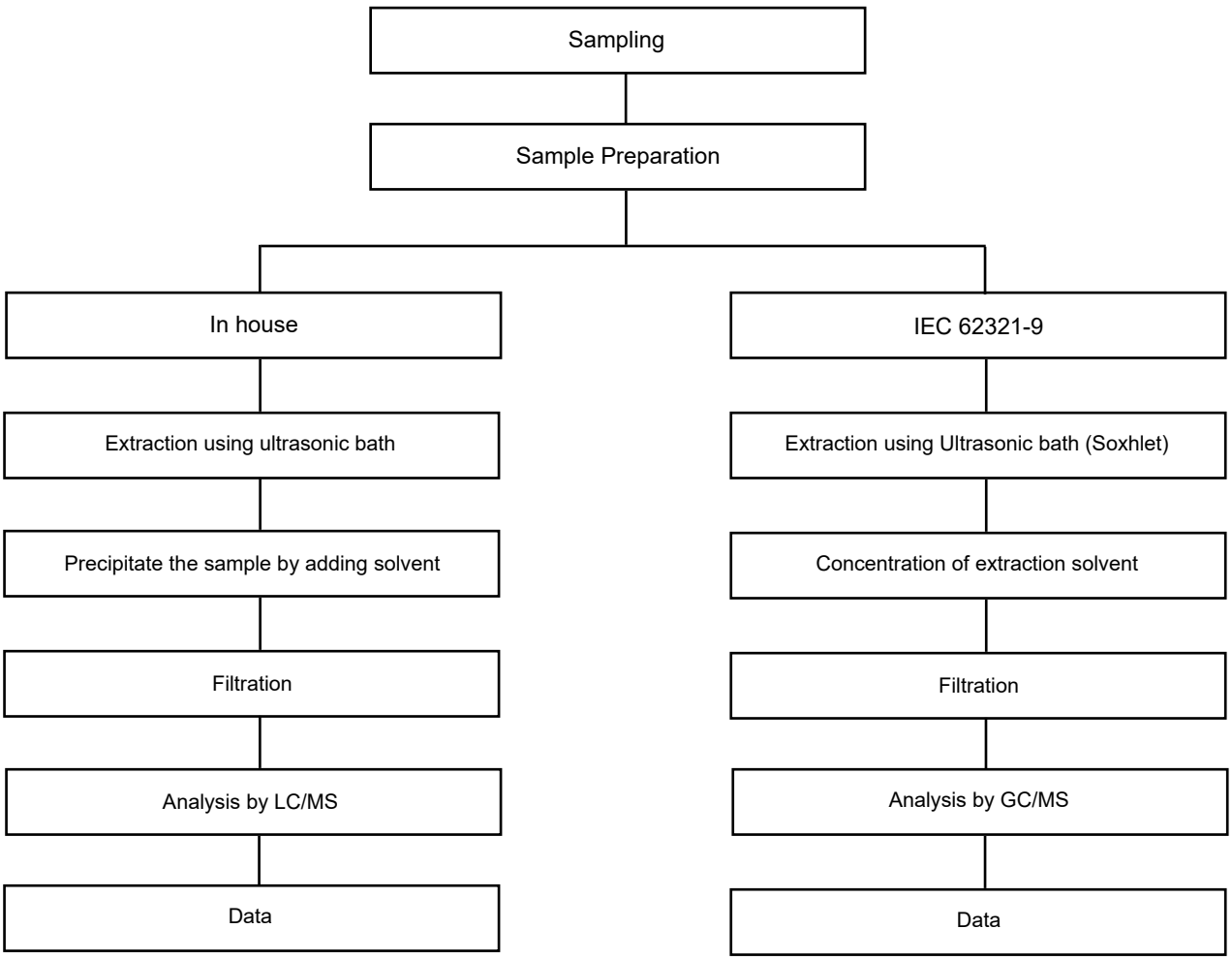


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Flow Chart for HBCDD

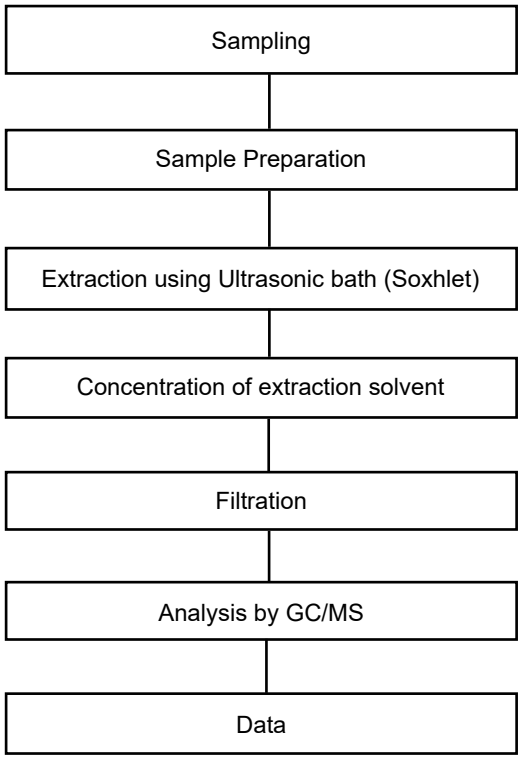


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Flow Chart for IEC Phthalates



***** End of Report *****

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Member of the SGS Group (Société Générale de Surveillance)

Test Report

No.: SHAEC25023902301 **Date:** Sep 17, 2025

Client Name: Shanghai Tinking Material Technology Co.,Ltd

Client Address: 1 Building, No.2328 Chunshen road, Minhang District, Shanghai, China.

Sample Name: Anode Ball

Model No.: 99.99% Anode Ball

Main Substance: Sn

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

SGS Job No.: SHP25-031430

Sample Receiving Date: Sep 11, 2025

Testing Period: Sep 11, 2025 ~ Sep 17, 2025

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 (PBB), Polybrominated diphenyl ethers (PBDE), Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP)	Pass
Element(s)	See Results
Halogen	See Results
Polychlorinated Biphenyls (PCBs)	See Results
Polychlorinated Naphthalenes (PCNs)	See Results
Polychlorinated Terphenyls (PCTs)	See Results
Polyvinyl Chloride(PVC)	See Results
short chain-chlorinated paraffins (SCCPs)	See Results

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

Tom Ni

Tom Ni
Approved Signatory

Scan to see the report

ED25017A

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Test Requirement	Conclusion
Hexabromocyclododecane (HBCDD)	See Results
Organic-tin compounds	See Results
PFOS, its salts and related compounds,PFOA, its salts	See Results

Test Result(s):

Test Part Description：

SN ID	Sample No.	SGS Sample ID	Description
SN1	A1	SHA25-0239023-0001.C001	Silvery metal

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 (PBB), Polybrominated diphenyl ethers (PBDE), 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 62321-7-1:2015, IEC 62321-6:2015 and IEC62321-8:2017, analysis was performed by ICP-OES/AAS, UV-Vis and GC-MS.

Test Item(s)	Limit	Unit(s)	MDL	A1
Lead (Pb)	1000	mg/kg	2	17
Mercury (Hg)	1000	mg/kg	2	ND
Cadmium (Cd)	100	mg/kg	2	ND
Hexavalent Chromium (Cr(VI))▼	-	μg/cm²	0.10	ND
Polybromobiphenyl (PBB)	1000	mg/kg	-	ND
Monobrominated biphenyl (MonoBB)	-	mg/kg	5	ND
Dibrominated biphenyl (DiBB)	-	mg/kg	5	ND
Tribrominated biphenyl (TriBB)	-	mg/kg	5	ND
Tetrabrominated biphenyl (TetraBB)	-	mg/kg	5	ND
Pentabrominated biphenyl (PentaBB)	-	mg/kg	5	ND
Hexabrominated biphenyl (HexaBB)	-	mg/kg	5	ND
Heptabrominated biphenyl (HeptaBB)	-	mg/kg	5	ND
Octabrominated biphenyl (OctaBB)	-	mg/kg	5	ND
Nonabrominated biphenyl (NonaBB)	-	mg/kg	5	ND
Decabrominated biphenyl (DecaBB)	-	mg/kg	5	ND
Polybromodiphenyl ether(PBDE)	1000	mg/kg	-	ND
Monobrominated diphenyl ether (MonoBDE)	-	mg/kg	5	ND
Dibrominated diphenyl ether (DiBDE)	-	mg/kg	5	ND
Tribrominated diphenyl ether (TriBDE)	-	mg/kg	5	ND

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Test Item(s)	Limit	Unit(s)	MDL	A1
Tetrabrominated diphenyl ether (TetraBDE)	-	mg/kg	5	ND
Pentabrominated diphenyl ether (PentaBDE)	-	mg/kg	5	ND
Hexabrominated diphenyl ether (HexaBDE)	-	mg/kg	5	ND
Heptabrominated diphenyl ether (HeptaBDE)	-	mg/kg	5	ND
Octabrominated diphenyl ether (OctaBDE)	-	mg/kg	5	ND
Nonabrominated diphenyl ether (NonaBDE)	-	mg/kg	5	ND
Decabrominated diphenyl ether (DecaBDE)	-	mg/kg	5	ND
Bis(2-ethylhexyl) phthalate (DEHP)	1000	mg/kg	50	ND
Butyl benzyl phthalate (BBP)	1000	mg/kg	50	ND
Dibutyl phthalate (DBP)	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) ▼ = a. The sample is positive for Cr(VI) if the Cr(VI)concentration is greater than 0.13 μg/cm^2. The sample coating is considered to contain Cr(VI).
b. The sample is negative for Cr(VI) if Cr(VI) is ND (concentration less than 0.10 μg/cm^2). The coating is considered a non-Cr(VI) based coating.
c. The result between 0.10 μg/cm^2 and 0.13 μg/cm^2 is considered to be inconclusive-unavoidable coating variations may influence the determination.

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

Element(s)

Test Method: With reference to US EPA 3050B:1996, analysis was performed by ICP-OES/AAS.

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

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Test Item(s)	Unit(s)	MDL	A1
Bromine(Br)	mg/kg	50	ND
Iodine(I)	mg/kg	50	ND

Polychlorinated Biphenyls (PCBs)

Test Method: With reference to US EPA 8082A:2007, analysis was performed by GC-MS.

Test Item(s)	CAS No.	Unit(s)	MDL	A1
2,2',5-Trichlorobiphenyl (PCB18)	37680-65-2	mg/kg	0.5	ND
2,4,4'-Trichlorobiphenyl (PCB28)	7012-37-5	mg/kg	0.5	ND
2,4',5-Trichlorobiphenyl (PCB31)	16606-02-3	mg/kg	0.5	ND
2,2',3,5'-Tetrachlorobiphenyl (PCB44)	41464-39-5	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
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (PCB206)	40186-72-9	mg/kg	0.5	ND
4-Chlorobiphenyl (PCB3)	2051-62-9	mg/kg	0.5	ND
2,4'- Dichlorobiphenyl (PCB8)	34883-43-7	mg/kg	0.5	ND
2,4,5-Trichlorobiphenyl (PCB29)	15862-07-4	mg/kg	0.5	ND
2,2',4,6-Tetrachlorobiphenyl (PCB50)	62796-65-0	mg/kg	0.5	ND
2,2',3,4',5',6-Hexachlorobiphenyl (PCB149)	38380-04-0	mg/kg	0.5	ND
2,2',3,3',4,4',5,5'- Octachlorobiphenyl (PCB194)	35694-08-7	mg/kg	0.5	ND
2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl (PCB209)	2051-24-3	mg/kg	0.5	ND

Polychlorinated Naphthalenes (PCNs)

Test Method: With reference to US EPA 8081B:2007, 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

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Test Item(s)	CAS No.	Unit(s)	MDL	A1
1,2,3,4,6-Pentachlorinated Naphthalene	67922-26-3	mg/kg	5	ND
Octa-chlorinated Naphthalene	2234-13-1	mg/kg	5	ND

Polychlorinated Terphenyls (PCTs)

Test Method: With reference to US EPA 8082A: 2007, analysis was performed by GC-MS.

Test Item(s)	CAS No.	Unit(s)	MDL	A1
Aroclor 5432	63496-31-1	mg/kg	5	ND
Aroclor 5442	12642-23-8	mg/kg	5	ND
Aroclor 5460	11126-42-4	mg/kg	5	ND

Polyvinyl Chloride(PVC)

Test Method: With reference to SGS in house method, analysis was performed by Py-GC-MS.

Test Item(s)	CAS No.	Unit(s)	MDL	A1
Polyvinyl chloride (PVC)	9002-86-2	%	0.05	ND

Notes:
(1) Polyvinyl chloride component includes its present in copolymer.

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(C_{10}-C_{13})(SCCP)	85535-84-8	mg/kg	50	ND

Hexabromocyclododecane (HBCDD)

Test Method: With reference to US EPA 3550C:2007 and US EPA 8270D:2014, analysis was performed by GC-MS.

Test Item(s)	CAS No.	Unit(s)	MDL	A1
Hexabromocyclododecane (HBCDD)	134237-50-6 /134237-51-7 /134237-52-8 /25637-99-4 /3194-55-6	mg/kg	10	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
Dibutyl tin(DBT)	mg/kg	0.02	ND

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Test Item(s)	Unit(s)	MDL	A1
Tributyl tin(TBT)	mg/kg	0.02	ND
Dioctyl tin(DOT)	mg/kg	0.02	ND
Tri-n-propyltin(TPT)	mg/kg	0.02	ND
Bis(tributyltin) oxide (TBTO) ◆	mg/kg	0.02	ND

Notes:
(1) ◆ TBTO is back calculated based on the worst-case scenario of TBT.

PFOS, its salts and related compounds,PFOA, its salts

Test Method: Modified EN 17681-1:2025, analysis was performed by LC-MS or LC-MS/MS.

Test Item(s)	CAS No.	Unit(s)	MDL	A1
PFOS, its salts				
Perfluorooctane sulfonic acid (PFOS), its salts^	1763-23-1	mg/kg	0.010	ND
PFOS-related compounds				
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), its salts^	754-91-6	mg/kg	0.010	ND
Perfluorooctane sulfonamidoacetic Acid (FOSAA), its salts^	2806-24-8	mg/kg	0.010	ND
N-Methylperfluoro-1-octanesulfonamidoacetic Acid (N-MeFOSAA), its salts^	2355-31-9	mg/kg	0.010	ND
N-Ethylperfluorooctane sulfonamidoacetic Acid (N-EtFOSAA), its salts^	2991-50-6	mg/kg	0.010	ND
Sum of PFOS-related compounds	-	mg/kg	-	ND
PFOA, its salts				
Perfluorooctanoic acid (PFOA), its salts^	335-67-1	mg/kg	0.010	ND

Notes:
(1) ^=Substances refer to its salts/derivative listed in below table.

Substances Name	**CAS No.**
PFOS, its salts & derivatives	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1
Potassium Perfluorooctanesulfonate (PFOS-K)	2795-39-3
Perfluorooctanesulfonic acid, lithium salt (PFOS-Li)	29457-72-5
Sodium perfluorooctanesulfonate (PFOS-Na)	4021-47-0
Ammonium perfluorooctanesulfonate ($PFOS\text{-}NH_4$)	29081-56-9

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Perfluorooctane sulfonate diethanolamine salt (PFOS-$NH_2(C_2H_4OH)_2$)	70225-14-8
Perfluorooctanesulfonic acid,tetraethylammonium salt (PFOS-$N(C_2H_5)_4$)	56773-42-3
N-decyl-N,N-dimethyldecan-1-aminium 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluorooctane-1-sulfonate (PFOS-$N(C_{10}H_{21})_2(CH_3)_2$)	251099-16-8
TetrabutylAmmonium perfluorooctanesulfonate (PFOS-$N(C_4H_9)_4$)	111873-33-7
Perfluorooctane Sulfonyl fluoride (PFOS-F)	307-35-7
Magnesium bis(heptadecafluorooctanesulphonate) (PFOS-Mg)	91036-71-4
Piperidine 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluorooctanesulfonate	71463-74-6
Perfluorooctanesulfonate	45298-90-6
Triethylammonium perfluorooctane sulfonate (PFOS-$N(C_2H_5)_3$)	54439-46-2
Tetramethylammonium perfluorooctane sulfonate (PFOS-$N(CH_3)_4$)	56773-44-5
N,N,N-Tripropylpentan-1-aminium heptadecafluorooctane-1-sulfonate (PFOS-$N(C_3H_7)_3(C_5H_{11})$)	56773-56-9
N,N-Dibutyl-N-methylbutan-1-aminium heptadecafluorooctane-1-sulfonate (PFOS-$N(C_4H_9)_3(CH_3)$)	124472-68-0
Iodonium, bis[4-(1,1-dimethylethyl)phenyl]-, salt with perfluoro-1-octanesulfonic acid (1:1)	213740-80-8
Diphenyl(2,4,6-trimethylphenyl)sulfonium perfluoro-1-octanesulfonate	258341-99-0
1-Hexadecylpyridinium perfluoro-1-octanesulfonate	334529-63-4
N,N,N-Triethyldecan-1-aminium heptadecafluorooctane-1-sulfonate	773895-92-4
Tetrabutylphosphonium perfluorooctane sulfonate (PFOS-P ($C_4H_9)_4$))	2185049-59-4
Perfluorooctanesulfonic acid diethylamine salt (PFOS-$C_4H_{11}N$)	2205029-08-7
heptyldimethyl{2-[(2-methylprop-2-enoyl)oxy]ethyl}azanium heptadecafluorooctane-1-sulfonate (PFOS-$C_{15}H_{30}NO_2$)	1203998-97-3
Perfluorooctane sulfonic anhydride (PFOSAN)	423-92-7
Perfluoro-1-octanesulfonyl chloride (PFOS-Cl)	423-60-9
FOSAA, its salts	
Perfluorooctane sulfonamidoacetic Acid (FOSAA)	2806-24-8
N-[(Perfluorooctyl)sulfonyl]glycinate (FOSAA(anion))	909405-47-6
N-[(Perfluorooctyl)sulfonyl]glycine potassium salt (1:1) (FOSAA-K)	75260-69-4
N-[(Perfluorooctyl)sulfonyl]glycine sodium salt (1:1) (FOSAA-Na)	115716-87-5
N-MeFOSAA, its salts	
N-Methylperfluoro-1-octanesulfonamidoacetic Acid (N-MeFOSAA)	2355-31-9
2-(N-Methylperfluorooctanesulfonamido)acetate (N-Me-FOSAA(anion))	909405-48-7
Potassium N-((heptadecafluorooctyl)sulphonyl)-N-methylglycinate (N-Me-FOSAA-K)	70281-93-5
N-EtFOSAA, its salts	
N-Ethylperfluorooctane sulfonamidoacetic Acid (N-EtFOSAA)	2991-50-6
Glycine, N-ethyl-N-[(heptadecafluorooctyl)sulfonyl]-, potassium salt (N-Et-FOSAA-K)	2991-51-7
2-(N-Ethyl-perfluorooctanesulfonamido)acetate (N-Et-FOSAA(anion))	909405-49-8
Ammonium 2-(N-ethylperfluorooctanesulfonamido)acetate (N-Et-FOSAA-NH_4)	2991-52-8
Sodium 2-(N-ethylperfluorooctanesulfonamido)acetate (N-Et-FOSAA-Na)	3871-50-9
PFOSA, its salts	
Perfluorooctane Sulfonamide (PFOSA)	754-91-6
Perfluorooctanesulfonamide lithium salt (1:1) (PFOSA-Li)	76752-79-9

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Perfluorooctanesulfonamide Sodium salt (1:1) (PFOSA-Na)	76752-78-8
Perfluorooctanesulfonamide Potassium salt (1:1) (PFOSA-K)	76752-70-0
Perfluorooctanesulfonamide Ammonium salt (1:1) (PFOSA-NH_4)	76752-72-2
Heptadecafluorooctane-1-sulphonamide, compound with triethylamine (1:1) (PFOSA-$C_6H_{15}N$)	76752-82-4
PFOA, its salts & derivatives	
Perfluorooctanoic acid (PFOA)	335-67-1
Sodium perfluorooctanoate (PFOA-Na)	335-95-5
Potassium perfluorooctanoate (PFOA-K)	2395-00-8
Silver perfluorooctanote (PFOA-Ag)	335-93-3
Perfluorooctanoyl fluoride (PFOA-F)	335-66-0
Ammonium pentadecafluorooctanoate (APFO)	3825-26-1
Lithium perfluorooctanoate (PFOA-Li)	17125-58-5
Cobalt perfluorooctanoate (PFOA-Co)	35965-01-6
Cesium perfluorooctanoate (PFOA-Cs)	17125-60-9
Octanoic acid, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluoro-, chromium(3+) (PFOA-Cr(3+))	68141-02-6
Pentadecafluorooctanoic acid--piperazine (2/1) (PFOA-NH($C_4H_{10}N$))	423-52-9
Pentadecafluorooctanoate (anion)	45285-51-6
Perfluorooctanoic Anhydride	33496-48-9
N,N,N-Triethylethanaminium perfluorooctanoate	98241-25-9
Perfluorooctanoate N,N,N-Trimethylmethanaminium	32609-65-7
Tetrapropylammonium perfluorooctanoate	277749-00-5
Potassium pentadecafluorooctanoate--water (1/1/2) (PFOA-K(H_2O)$_2$)	98065-31-7
Perfluorooctanoic acid compd. with ethanamine (1:1) (PFOA-C_2H_7N)	1376936-03-6
Pentadecafluorooctanoic acid--pyridine (1/1) (PFOA-C_5H_5N)	95658-47-2
pentadecafluorooctanoic acid- 1-phenylpiperazine(1:1) (PFOA-$C_{10}H_{14}N_2$)	1514-68-7
N,N,N-Trimethyloctan-1-aminium pentadecafluorooctanoate (PFOA-$C_{11}H_{26}N$)	927835-01-6
Pentadecafluorooctanoyl chloride (PFOA-Cl)	335-64-8

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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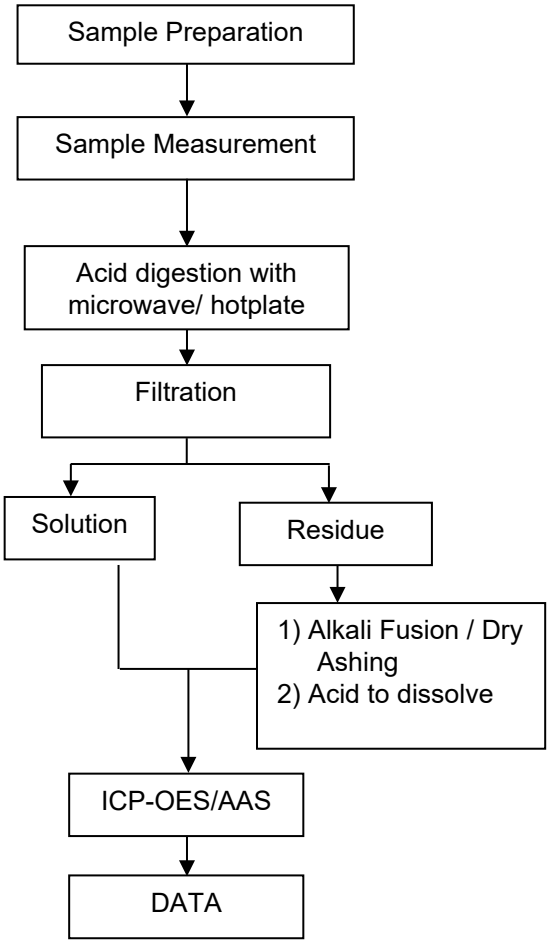
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Elements Testing Flow Chart

Name of the person who made testing: Meria Jin/Sielina Song
Name of the person in charge of testing: John Cheng
These samples were dissolved totally by pre-conditioning method according to below flow chart.



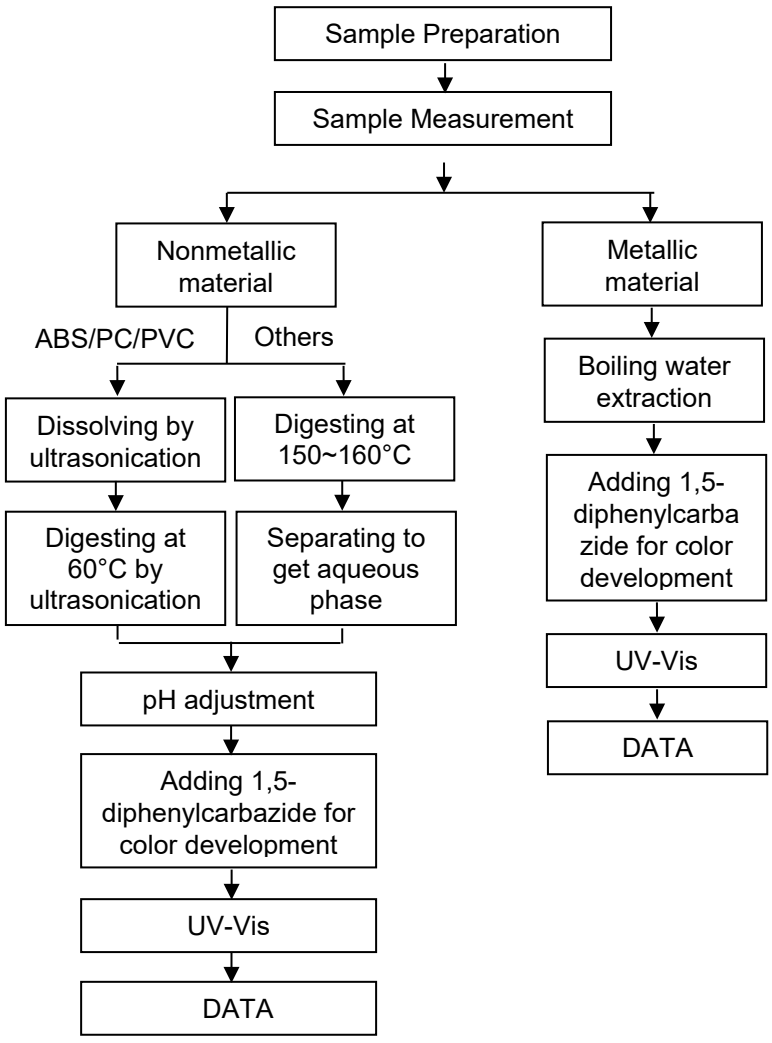
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Hexavalent Chromium (Cr(VI)) Testing Flow Chart

Name of the person who made testing: Alex Wang
Name of the person in charge of testing: Xiaolong Yang



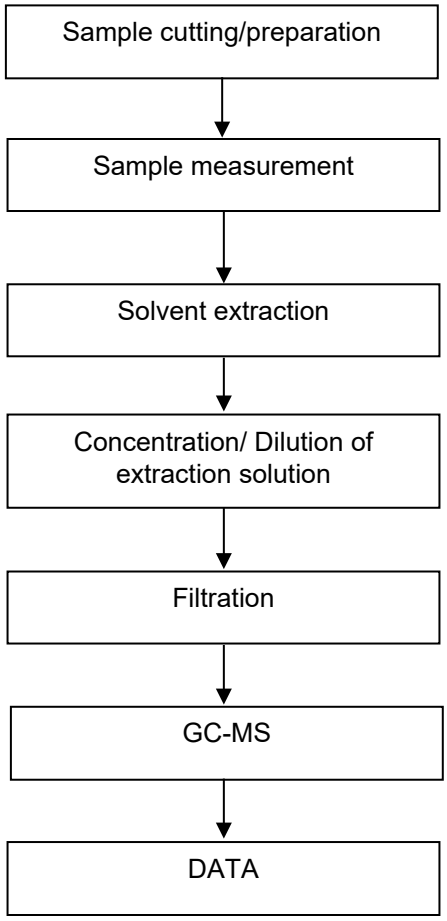
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PBB(s)/PBDE(s) Testing Flow Chart

Name of the person who made testing: Gary Xu
Name of the person in charge of testing: Carol Cui



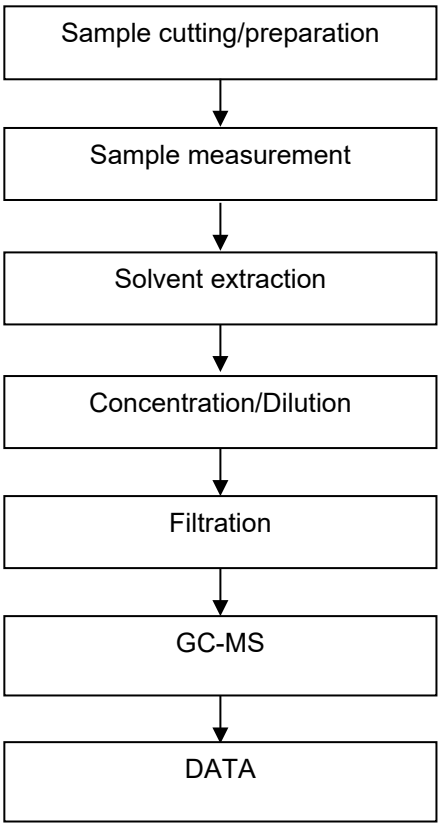
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Phthalates Testing Flow Chart

Name of the person who made testing: xiaoqiang zhang
Name of the person in charge of testing: Carol Cui



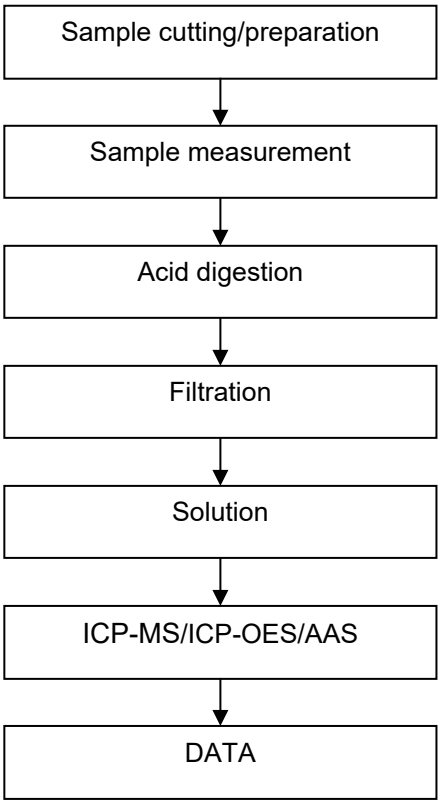
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Elements Testing Flow Chart

Name of the person who made testing: Meria Jin/Sielina Song
Name of the person in charge of testing: Carey Shan



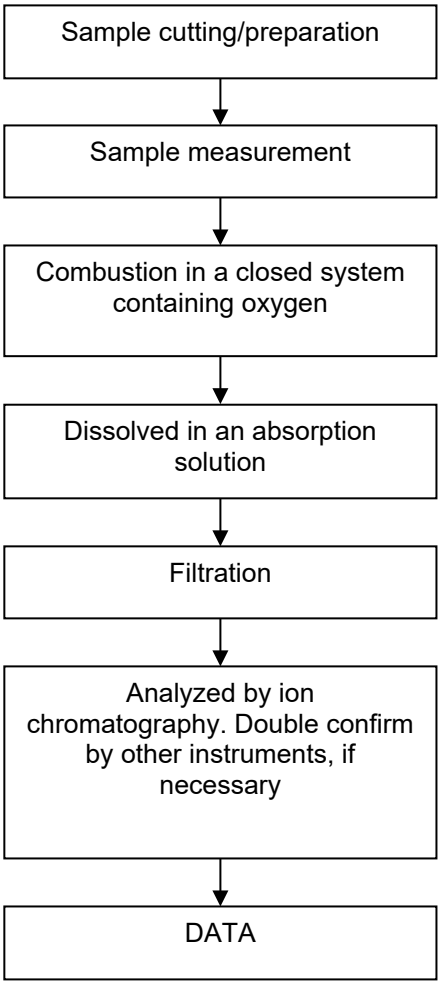
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Halogen Testing Flow Chart

Name of the person who made testing: Andy Zhang
Name of the person in charge of testing: Jinjing Sun



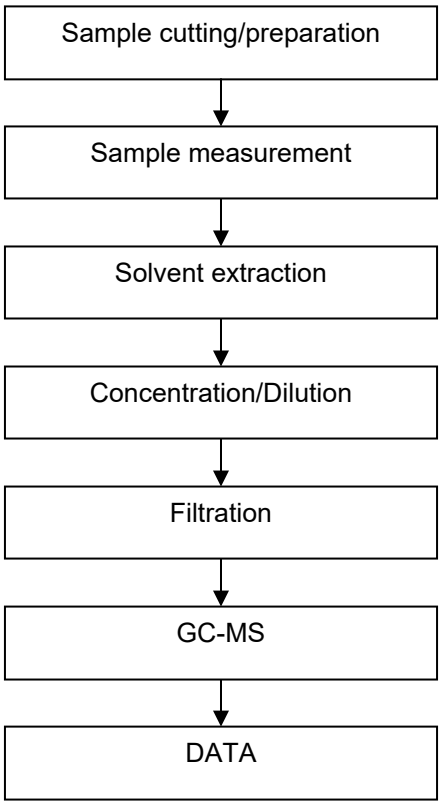
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PCB Testing Flow Chart

Name of the person who made testing: Stella Jiang
Name of the person in charge of testing: Mia Wang



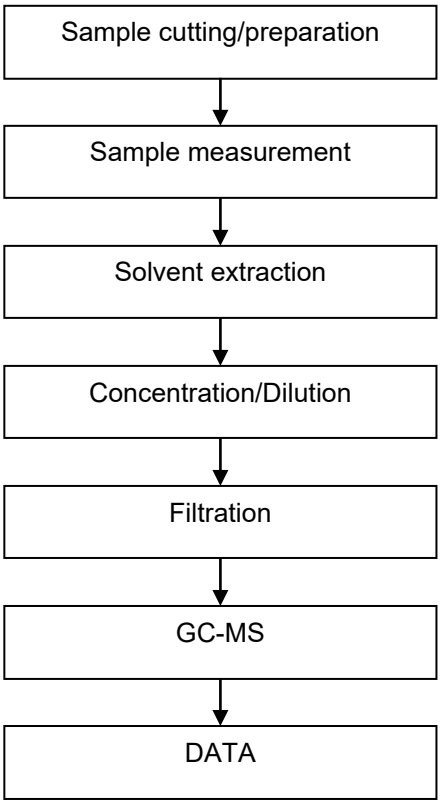
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PCN Testing Flow Chart

Name of the person who made testing: Stella Jiang
Name of the person in charge of testing: Mia Wang



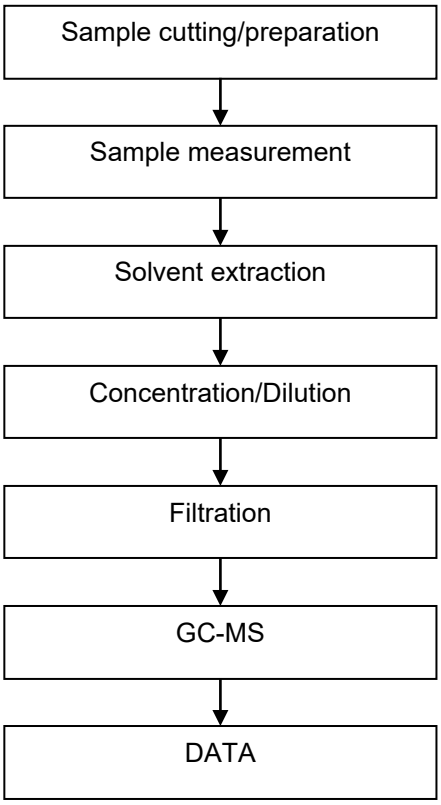
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PCT Testing Flow Chart

Name of the person who made testing: Stella Jiang
Name of the person in charge of testing: Mia Wang



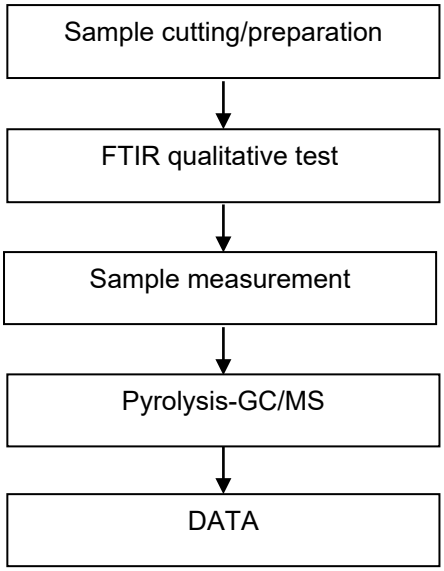
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PVC Testing Flow Chart

Name of the person who made testing: Mina Mi
Name of the person in charge of testing: Janice Zhang



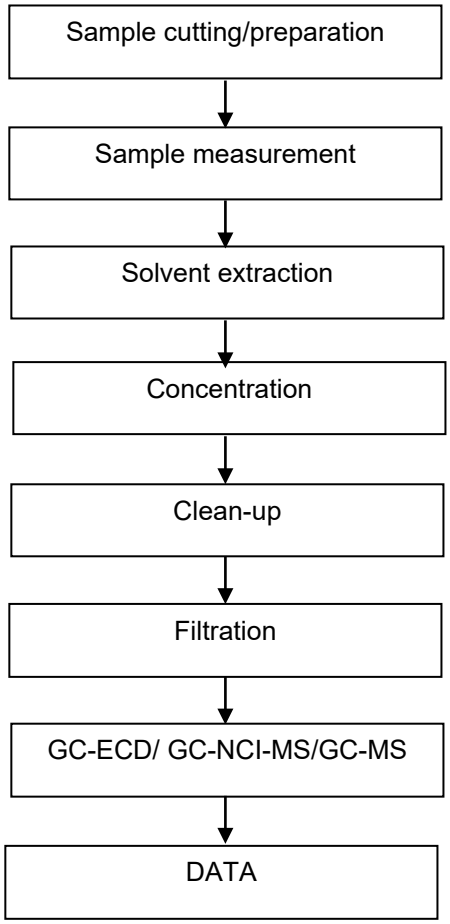
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Chlorinated Paraffin Testing Flow Chart

Name of the person who made testing: Stella Jiang
Name of the person in charge of testing: Mia Wang



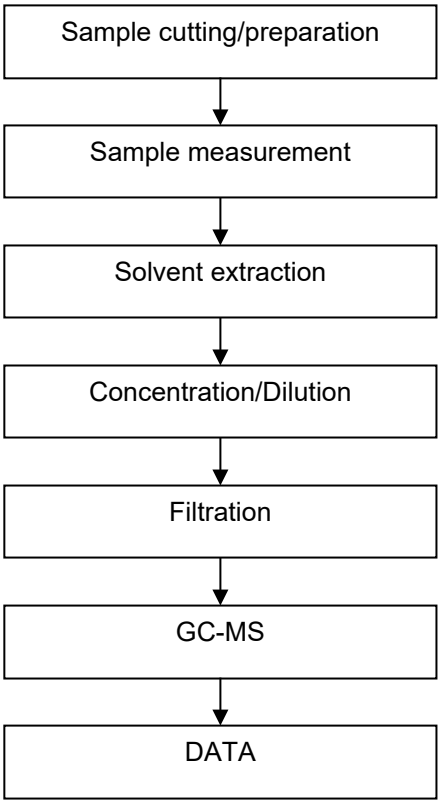
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HBCDD Testing Flow Chart

Name of the person who made testing: Gary Xu
Name of the person in charge of testing: Carol Cui



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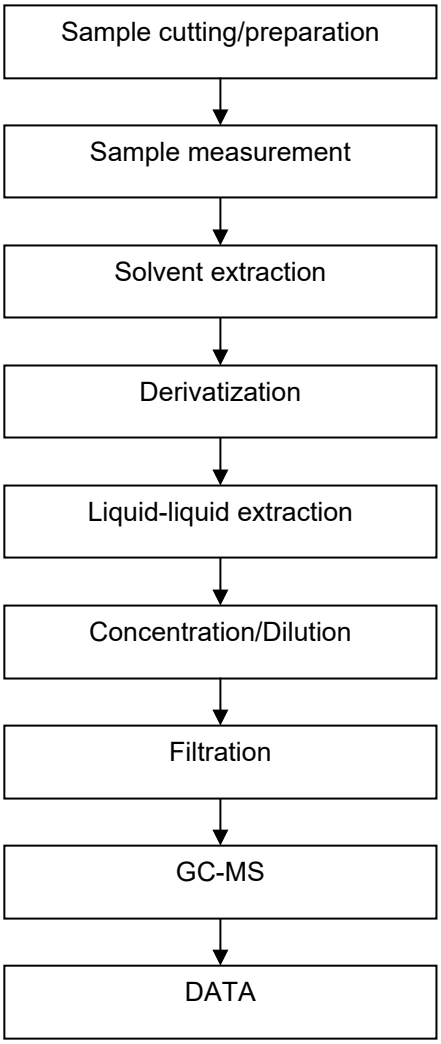
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Organotin Testing Flow Chart

Name of the person who made testing: Yuki liu
Name of the person in charge of testing: Liyas Wang



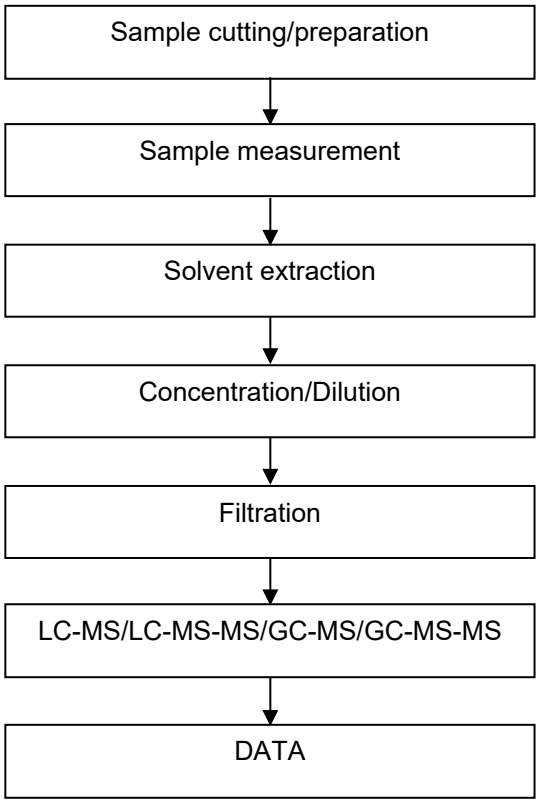
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PFASs/ PFOS/PFOA Testing Flow Chart

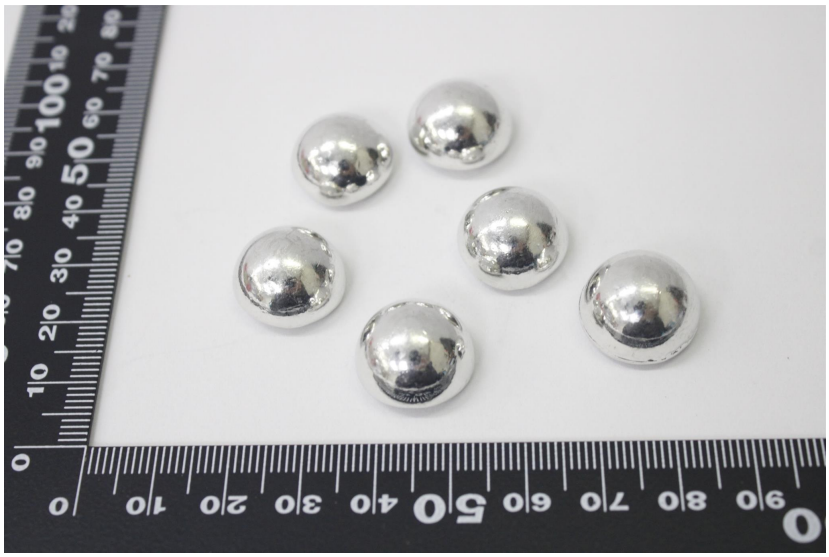
Name of the person who made testing: Ance Chen
Name of the person in charge of testing: Liyas Wang



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Sample Photo:



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*** End of Report ***

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Test Report

No.: ETR25B02790 Date: 04-Dec-2025

NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

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

Sample Name	:	NIPPON COPPER WIRE
Style/Item No.	:	COPPER WIRE(EX1)
Tel	:	+81-4-2934-6101

==========

Sample Receiving Date	:	17-Nov-2025
Testing Period	:	17-Nov-2025 to 04-Dec-2025

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 indicated by the client, the sample(s) was/were tested for the specified items with reference to Annex XVII of REACH Regulation (EC) No 1907/2006. Please refer to the 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 testing performed on the sample(s), the results of the specified test items comply with the limits set by Annex XVII of REACH Regulation (EC) No 1907/2006.

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

PIN CODE: 174CE9A3

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NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

Test Part Description

No.1 : SILVER COLORED METAL WIRE (INCLUDING THE PLATING LAYER)

Test Method : With reference to RSTS-EE-SVHC-007, analysis was performed by ICP-OES.

Test Result(s) (Unit: %)

Substance Name	RL	Result	Limit
		No.1	
Barium (Ba)	0.005	n.d.	-
Silicic acid (H2Si2O5), barium salt (1:1), lead-doped (※ B) (CAS No.: 68784-75-8)	0.05	n.d.	-

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Cadmium (Cd)	With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.	mg/kg	2	n.d.	100
Lead (Pb)	With reference to IEC 62321-5: 2013, analysis was performed by ICP-OES.	mg/kg	2	n.d.	1000
Mercury (Hg)	With reference to IEC 62321-4: 2013+ AMD1: 2017, analysis was performed by ICP-OES.	mg/kg	2	n.d.	1000
Hexavalent Chromium Cr(VI) (#2)	With reference to IEC 62321-7-1: 2015, analysis was performed by UV-VIS.	μg/cm²	0.1	n.d.	-
Monobromobiphenyl	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

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Test Item(s)	Method	Unit	MDL	Result No.1	Limit
Monobromodiphenyl ether	With reference to IEC 62321-6: 2015, analysis was performed by GC/MS.	mg/kg	5	n.d.	-
Dibromodiphenyl ether		mg/kg	5	n.d.	-
Tribromodiphenyl ether		mg/kg	5	n.d.	-
Tetrabromodiphenyl ether		mg/kg	5	n.d.	-
Pentabromodiphenyl ether		mg/kg	5	n.d.	-
Hexabromodiphenyl ether		mg/kg	5	n.d.	-
Heptabromodiphenyl ether		mg/kg	5	n.d.	-
Octabromodiphenyl ether		mg/kg	5	n.d.	-
Nonabromodiphenyl ether		mg/kg	5	n.d.	-
Decabromodiphenyl ether		mg/kg	5	n.d.	-
Sum of PBDEs		mg/kg	-	n.d.	1000
Polychlorinated biphenyls (PCBs)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	0.5	n.d.	-
Polychlorinated naphthalene (PCNs)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	5	n.d.	-
Polychlorinated terphenyls (PCTs)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	0.5	n.d.	-
Short Chain Chlorinated Paraffins(C10-C13) (SCCP) (CAS No.: 85535-84-8)	With reference to ISO 18219-1: 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.	-

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Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Fluorine (F) (CAS No.: 14762-94-8)	With reference to BS EN 14582: 2016, 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.	-
Antimony (Sb) (CAS No.: 7440-36-0)	With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.	mg/kg	2	n.d.	-
Beryllium (Be) (CAS No.: 7440-41-7)	With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.	mg/kg	2	n.d.	-
Arsenic (As) (CAS No.: 7440-38-2)	With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.	mg/kg	2	n.d.	-
Polyvinyl chloride (PVC)	With reference to ASTM E1252: 2021, analysis was performed by FT-IR and Flame Test.	**	-	Negative	-
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.	-
Butyl benzyl phthalate (BBP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Dibutyl phthalate (DBP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Di-(2-ethylhexyl) phthalate (DEHP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Diisobutyl phthalate (DIBP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000

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Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
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.	-
Di-n-pentyl phthalate (DNPP) (CAS No.: 131-18-0)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Di-n-hexyl phthalate (DNHP) (CAS No.: 84-75-3)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Bis(2-methoxyethyl) phthalate (DMEP) (CAS No.: 117-82-8)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Diisopentyl phthalate (DIPP) (CAS No.: 605-50-5)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
N-pentyl iso-pentyl phthalate (NPIPP) (CAS No.: 776297-69-9)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich (DIHP) (CAS No.: 71888-89-6)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters (DHNUP) (CAS No.: 68515-42-4)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Red Phosphorus	Analysis was performed by Pyrolyzer-GC/MS.	**	-	Negative	-
Decabromodiphenylethane (CAS No.: 84852-53-9)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	5	n.d.	-

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Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Perfluorooctane sulfonates and its salts (PFOS and its salts) (CAS No.: 1763-23-1 and its salts)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorooctanoic acid and its salts (PFOA and its salts) (CAS No.: 335-67-1 and its salts)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorononan-1-oic acid and its salts (PFNA and its salts) (CAS No.: 375-95-1 and its salts)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluoro-3,7-dimethyloctanoic Acid (PF-3,7-DMOA) (CAS No.: 172155-07-6)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorodecane acid and its salts (PFDA and its salts) (CAS No.: 335-76-2 and its salts)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluoroundecanoic acid and its salts (PFUnDA and its salts) (CAS No.: 2058-94-8 and its salts)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorododecanoic acid and its salts (PFDoDA and its salts) (CAS No.: 307-55-1 and its salts)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Pentacosafluorotridecanoic acid and its salts (PFTrDA and its salts) (CAS No.: 72629-94-8 and its salts)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorotetradecanoic acid and its salts (PFTDA and its salts) (CAS No.: 376-06-7 and its salts)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Sum of C9-C14 PFCAs and their salts	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by LC/MS/MS.	mg/kg	-	n.d.	0.025

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NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Mono-[2-(perfluorooctyl)ethyl]phosphate and its salts (8:2 monoPAP and its salts) (CAS No.: 57678-03-2 and its salts)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by LC/MS/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-Perfluorodecanesulfonic acid and its salts (8:2 FTS and its salts) (CAS No.: 39108-34-4 and its salts)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
1H,1H,2H,2H-Perfluoro-1-decanol (8:2 FTOH) (CAS No.: 678-39-7)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by GC/MS and LC/MS/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-Perfluorodecyl acrylate (8:2 FTA) (CAS No.: 27905-45-9)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, 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)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
2H,2H-Perfluorodecane acid and its salts (H2PFDA and its salts) (CAS No.: 27854-31-5 and its salts)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
1H,1H,2H,2H-Perfluorodecyl iodide (8_2 FTI) (CAS No.: 2043-53-0)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-Perfluorodecyltriethoxysilane (8:2 FTSi(OC2H5)3) (CAS No.: 101947-16-4)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
2H,2H,3H,3H-Perfluoroundecanoic Acid and its salts (4HPFUnA and its salts) (CAS No.: 34598-33-9 and its salts)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
1H,1H,2H-Heptadecafluoro-1-decene (PFDE) (CAS No.: 21652-58-4)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-

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Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Bis(1H,1H,2H,2H-Perfluorodecyl)phosphate and its salts (8_2diPAP and its salts) (CAS No.: 678-41-1 and its salts)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
1H,1H,2H,2H-Perfluorodecyltrichlorosilane (CAS No.: 78560-44-8)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-Perfluorodecyltrimethoxysilane (CAS No.: 83048-65-1)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by GC/MS.				
1H,1H,2H,2H-Heptadecafluorodecyl acetate (8:2 FTOAc) (CAS No.: 37858-04-1)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
Perfluorodecylphosphonic acid (PFDPA and its salts) (CAS No.: 52299-26-0 and its salts)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorodecane sulfonate and its salts (PFDS and its salts) (CAS No.: 335-77-3 and its salts)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
1H,1H,2H,2H-Perfluoro-1-dodecanol (10:2FTOH) (CAS No.: 865-86-1)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by GC/MS and LC/MS/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-Perfluorododecylacrylate (10:2FTA) (CAS No.: 17741-60-5)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-Perfluorododecyl methacrylate (10:2 FTMA) (CAS No.: 2144-54-9)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-perfluorotetradecan-1-ol (12:2 FTOH) (CAS No.: 39239-77-5)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by GC/MS and LC/MS/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-Perfluorododecane sulfonic acid and its salts (10:2 FTS and its salts) (CAS No.: 120226-60-0 and its salts)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-

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Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
1H,1H,2H,2H-Perfluorododecyl iodide (10:2 FTI) (CAS No.: 2043-54-1)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
1H,1H,2H,2H-Perfluorotetradecyl iodide (12:2 FTI) (CAS No.: 30046-31-2)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
Perfluorononane sulfonic acid and its salts (PFNS and its salts) (CAS No.: 68259-12-1 and its salts)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluoroundecane sulfonic acid and its salts (PFUnDS and its salts) (CAS No.: 749786-16-1 and its salts)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorododecane sulfonic acid and its salts (PFDoDS and its salts) (CAS No.: 79780-39-5 and its salts)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorotridecane sulfonic acid and its salts (PFTrDS and its salts) (CAS No.: 791563-89-8 and its salts)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
10:2 Fluortelomerphosphatediester and its salts (10:2 diPAP and its salts) (CAS No.: 1895-26-7 and its salts)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by LC/MS/MS.	mg/kg	0.1	n.d.	-
Perfluorododecyl iodide (PFDoDI) (CAS No.: 307-60-8)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
Perfluorodecyl iodide (PFDI) (CAS No.: 423-62-1)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
2H-Perfluoro-2-dodecenoic acid (10:2 FTUCA) (CAS No.: 70887-94-4)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
2-Perfluorodecyl ethanoic acid (10:2 FTCA) (CAS No.: 53826-13-4)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-

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Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
1-Dodecanol, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,12-heneicosafluoro-, 1-acetate (10:2 FTOAc) (CAS No.: 37858-05-2)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
10:2 Fluortelomerphosphatemonoester (10:2 monoPAP and its salts) (CAS No.: 57678-05-4 and its salts)	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by LC/MS/MS.	mg/kg	0.1	n.d.	-
Sum of C9-C14 PFCA-related substances	Modified EN 17681-1: 2022 & EN 17681-2: 2022, analysis was performed by GC/MS and LC/MS/MS.	mg/kg	-	n.d.	0.260

Note：

1. mg/kg = ppm ; 0.1wt% = 0.1% = 1000ppm
2. RL = Reporting Limit ; MDL = Method Detection Limit
3. n.d. = Not Detected (Less than RL / MDL)
4. "-" = Not Regulated
5. **= Qualitative analysis (No Unit)
6. Negative = Undetectable ; Positive = Detectable
7. (#2) =
   a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 μg/cm². The sample coating is considered to contain Cr(VI).
   b. The sample is negative for Cr(VI) if Cr(VI) is n.d. (concentration less than 0.10 μg/cm²). The coating is considered a non-Cr(VI) based coating
   c. The result between 0.10 μg/cm² and 0.13 μg/cm² is considered to be inconclusive - unavoidable coating variations may influence the determination.
8. ▲ : The MDL was evaluated for element / tested substance.
   Conversion Formula：AX = A × 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
9. (※ B): Only if both qualitative results of lead and silicon are positive, the test result of the compound will be calculated based on the concentration of barium.
10. Unless otherwise stated , the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule (w=0) stated in ILAC-G8:09/2019. According to this rule, the judgement of conformity is based on the comparing test results with limits.

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PFAS Remark：

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

Group Name	Substance Name	CAS No.
PFOS, its salts & derivatives	Perfluorooctane sulfonates (PFOS)	1763-23-1
	Potassium perfluorooctanesulfonate (PFOS-K)	2795-39-3
	Perfluorooctanesulfonic acid, lithium salt (PFOS-Li)	29457-72-5
	Perfluorooctanesulfonic acid, ammonium salt (PFOS-NH_4)	29081-56-9
	Perfluorooctane sulfonate diethanolamine salt (PFOS-NH(C2H4OH)2)	70225-14-8
	Perfluorooctanesulfonic acid,tetraethylammonium salt (PFOS-$N(C_2H_5)_4$)	56773-42-3
	N-decyl-N,N-dimethyldecan-1-aminium 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluorooctane-1-sulfonate (PFOS-DDA)	251099-16-8
	TetrabutylAmmonium perfluorooctanesulfonate (PFOS-$N(C_4H_9)_4$)	111873-33-7
	Perfluorooctane sulfonyl fluoride (POSF)	307-35-7
	Perfluorooctanesulfonic acid, magnesium salt (PFOS-Mg)	91036-71-4
	Perfluorooctanesulfonic acid, sodium salt (PFOS-Na)	4021-47-0
	Piperidine 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluorooctanesulfonate	71463-74-6
	Perfluorooctanesulfonate (anion)	45298-90-6
	1-Octanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-, compd. with N,N-diethylethanamine (1:1) (PFOS-$NH(C_2H_5)_3$)	54439-46-2

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Group Name	Substance Name	CAS No.
PFOS, its salts & derivatives	Methanaminium, N,N,N-trimethyl-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1-octanesulfonate (1:1) (PFOS-N(CH_3)$_4$)	56773-44-5
	1-Pentanaminium, N,N,N-tripropyl-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1-octanesulfonate (1:1) (PFOS-N(C_3H_7)$_3$(C_5H_{11}))	56773-56-9
	1-Butanaminium, N,N-dibutyl-N-methyl-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1-octanesulfonate (1:1) (PFOS-N(C_4H_9)$_3$(CH_3))	124472-68-0
	Iodonium, bis[4-(1,1-dimethylethyl)phenyl]-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1-octanesulfonate (1:1)	213740-80-8
	Sulfonium, diphenyl(2,4,6-trimethylphenyl)-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1-octanesulfonate (1:1)	258341-99-0
	Pyridinium, 1-hexadecyl-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1-octanesulfonate (1:1)	334529-63-4
	1-Decanaminium, N,N,N-triethyl-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1-octanesulfonate (1:1)	773895-92-4
	Tetrabutylphosphonium perfluorooctane sulfonate (PFOS-P(C_4H_9)$_4$))	2185049-59-4
	Perfluorooctanesulfonic acid diethylamine salt (PFOS-$C_4H_{11}N$)	2205029-08-7
	Heptyldimethyl{2-[(2-methylprop-2-enoyl)oxy]ethyl}azanium perfluorooctanesulfonate (PFOS-$C_{15}H_{30}NO_2$)	1203998-97-3
	1-Octanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-, 1,1'-anhydride (PFOSAN)	423-92-7
	Perfluoro-1-octanesulfonyl chloride (PFOS-Cl)	423-60-9
PFOA, its salts & derivatives	Perfluorooctanoic acid (PFOA)	335-67-1
	Sodium perfluorooctanoate (PFOA-Na)	335-95-5
	Potassium perfluorooctanoate (PFOA-K)	2395-00-8
	Silver perfluorooctanote (PFOA-Ag)	335-93-3

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Group Name	Substance Name	CAS No.
PFOA, its salts & derivatives	Perfluorooctanoyl fluoride (PFOA-F)	335-66-0
	Ammonium pentadecafluorooctanoate (APFO)	3825-26-1
	Lithium perfluorooctanoate (PFOA-Li)	17125-58-5
	Cobalt perfluorooctanoate (PFOA-Co)	35965-01-6
	Cesium perfluorooctanoate (PFOA-Cs)	17125-60-9
	Octanoic acid, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluoro-, chromium(3+) (PFOA-Cr(3^+))	68141-02-6
	Pentadecafluorooctanoic acid--piperazine (2/1)PFOA-NH($C_4H_{10}N$)	423-52-9
	Pentadecafluorooctanoate (anion)	45285-51-6
	Perfluorooctanoic Anhydride	33496-48-9
	Ethanaminium, N,N,N-triethyl-, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluorooctanoate (1:1)	98241-25-9
	Tetramethylammoniumperfluoroctanoat	32609-65-7
	1-Propanaminium, N,N,N-tripropyl-, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluorooctanoate (1:1)	277749-00-5
	Octanoic acid, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluoro-, potassium salt, hydrate (1:1:2) (PFOA-K($H_2O)_2$)	98065-31-7
	Octanoic acid, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluoro-, compd. with ethanamine (1:1) (PFOA-C_2H_7N)	1376936-03-6
	Octanoic acid, pentadecafluoro-, compd. with pyridine (1:1) (9CI) (PFOA-C_5H_5N)	95658-47-2
	Pentadecafluorooctanoic acid- 1-phenylpiperazine(1:1) (PFOA-$C_{10}H_{14}N_2$)	1514-68-7
	1-Octanaminium, N,N,N-trimethyl-, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluorooctanoate (1:1) (PFOA- $C_{11}H_{26}N$)	927835-01-6
	Pentadecafluorooctanoyl chloride (PFOA-Cl)	335-64-8
	Perfluorooctanoyl Bromide (PFOA-Br)	222037-87-8
8:2 monoPAP, its salts	Mono-[2-(perfluorooctyl)ethyl]phosphate (8:2 monoPAP)	57678-03-2
	8:2 Fluorotelomer diammonium phosphate	93857-44-4
	Disodium 1H,1H,2H,2H-perfluorodecylphosphate	438237-75-3
	Ammonium bis[2-(perfluorohexyl)ethyl] phosphate	1764-95-0
	3,3,4,4,5,5,6,6,7,7,8,8,8-Tridecafluorooctanol phosphate ammonium salt	92401-44-0
	Sodium 1H,1H,2H,2H-perfluorooctylphosphate	144965-22-0
	Monopotassium monoperfluorohexyl ethylphosphate	150033-28-6
	Ammonium 2-(perfluorohexyl)ethyl hydrogen phosphate	2353-52-8
8:2 FTS, its salts	1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2 FTS)	39108-34-4
	1H,1H,2H,2H-Perfluorodencane sulfonate acid Potassium salt (8:2 FTS-K)	438237-73-1
	1H,1H,2H,2H-Perfluorodencane sulfonate acid Ammonium salt (8:2 FTS-NH_4)	149724-40-3

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NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

Group Name	Substance Name	CAS No.
8:2 FTS, its salts	1H,1H,2H,2H-Perfluorodencane sulfonate acid Sodium salt (8:2 FTS-Na)	27619-96-1
	8: 2 Fluorotelomer sulfonate (anion) (8:2 FTS(anion))	481071-78-7
	2-(Perfluorooctyl)ethanesulfonyl chloride (8:2 FTS-Cl)	27619-90-5
H2PFDA, its salts	2H,2H-Perfluorodecane acid (H2PFDA)	27854-31-5
	Tetrabutylphosphonium 2H,2H-Perfluorodecanoate	882489-14-7
4HPFUnA, its salts	2H,2H,3H,3H-Perfluoroundecanoic Acid (4HPFUnA)	34598-33-9
	Potassium 2H,2H,3H,3H-Perfluoroundecanoate (H4PFUnA-K)	83310-58-1
	Lithium 3-(perfluorooctyl)propanoate (H4PFUnA-Li)	67304-23-8
8:2diPAP, its salts	Bis(1H,1H,2H,2H-Perfluorodecyl)phosphate (8:2diPAP)	678-41-1
	Sodium bis(1H,1H,2H,2H-perfluorodecyl)phosphate (8:2diPAP-Na)	114519-85-6
	Bis(2-hydroxyethyl)ammonium bis((perfluorooctyl)ethyl) hydrogen phosphate	57677-97-1
	Bis[2-(perfluorooctyl)ethyl] phosphate ammonium salt (8:2diPAP-NH_4)	93776-20-6
	8:2 Fluorotelomer phosphate diester ion	1411713-91-1
PFNA, its salts	Perfluorononan-1-oic acid (PFNA)	375-95-1
	Perfluorononanoate Na-salt (PFNA-Na)	21049-39-8
	Perfluorononanoate ammounium salt (APFN)	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
	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-$NH_2(C_2H_5)_2$)	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-$NH(C_2H_5)_3$)	327176-80-7
	Nonanoic acid, heptadecafluoro-, compd. with piperidine (1:1) (9CI) (PFNA-$NH_2(C_5H_{10})$)	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-$NH_3(C_6H_5)$)	95682-67-0
	Nonanoic acid, heptadecafluoro-, compd. with cyclohexanamine (1:1) (9CI) (PFNA-$NH_3(C_6H_{11})$)	328531-06-2
	Perfluorononanoate (anion)	72007-68-2
	4-[(6-Methoxy-3-pyridazinyl)sulfamoyl]anilinium heptadecafluorononanoate (PFNA-$C_{11}H_{12}N_4O_3S$)	298703-33-0
	Perfluorononanoic anhydride (PFNAA)	228407-54-3

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NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

Group Name	Substance Name	CAS No.
PFNA, its salts	Perfluorononanoyl chloride (PFNA-Cl)	52447-23-1
	Perfluorononanoyl fluoride (PFNA-F)	558-95-2
	Heptadecafluorononanoyl Bromide (PFNA-Br)	261503-42-8
PFDA, its salts	Perfluorodecane acid (PFDA)	335-76-2
	Perfluorodecanoate Na-salt (PFDA-Na)	3830-45-3
	Perfluorodecanoate ammonium salt (APFDA)	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 (PFDAA)	942199-24-8
	Nonadecafluorodecanoyl chloride (PFDA-Cl)	307-38-0
	Nonadecafluorodecanoyl Fluoride (PFDA-F)	-
PFDPA, its salts	Perfluorodecylphosphonic acid (PFDPA)	52299-26-0
	Perfluorodecylphosphonic Acid 4-Methylbenzamine	-
	Perfluorodecylphosphonic Acid Di-4-toluidine Salt	-
PFUnDA, its salts	Perfluoroundecanoic acid (PFUnDA)	2058-94-8
	Ammonium perfluoroundecanoate (PFUnDA-NH_4)	4234-23-5
	Perfluoroundecanoic acid sodium salt (PFUnDA-Na)	60871-96-7
	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 perfluorododecanoate (APFDoDA)	3793-74-6
	Perfluorododecanoate (anion)	171978-95-3
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
	Perfluoroaliphatic dean-sulfonate salt of NH_4 (PFDS-NH_4)	67906-42-7
	Perfluorodecane sulfonate (anion)	126105-34-8
	Perfluorodecane sulfonic anhydride (PFDSA)	51667-62-0
	Perfluorodecanesulphonyl fluoride (PFDS-F)	307-51-7
	Perfluorodecanesulphonyl chloride (PFDS-Cl)	32779-61-6
PFTrDA, its salts	Pentacosafluorotridecanoic acid (PFTrDA)	72629-94-8
	Ammonium perfluorotridecanoate (PFTrDA-NH_4)	4288-72-6
	Sodium perfluorotridecanoate (PFTrDA-Na)	60872-01-7
	Perfluorotridecanoate (anion)	862374-87-6

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NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

Group Name	Substance Name	CAS No.
PFTDA, its salts	Perfluorotetradecanoic acid (PFTDA)	376-06-7
	Perfluorotetradecanoate (anion)	365971-87-5
10:2 FTS, its salts	1H,1H,2H,2H-Perfluorododecane sulfonic acid (10:2 FTS)	120226-60-0
	1H,1H,2H,2H-Perfluorododecane sulfonic acid Sodium Salt (10:2 FTS-Na)	108026-35-3
	2-(Perfluorodecyl)ethane-1-sulfonyl chloride (10:2 FTS-Cl)	27619-91-6
PFNS, its salts	Perfluorononane 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
	Perfluorononanesulfonyl fluoride (PFNS-F)	68259-06-3
PFUnDS, its salts	Perfluoroundecane sulfonic acid (PFUnDS)	749786-16-1
	Perfluoroundecanesulfonate (anion)	441296-91-9
PFDoDS, its salts	Perfluorododecane sulfonic acid (PFDoDS)	79780-39-5
	Sodium perfluoro-1-dodecanesulfonate (PFDoDS-Na*)	1260224-54-1
	Potassium perfluorododecanesulfonate (PFDoDS-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 Fluortelomerphosphatediester (10:2 diPAP)	1895-26-7
	bis[3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,12-henicosafluorododecyl] hydrogen phosphate, compound with 2,2'-iminodiethanol (1:1) (10:2 diPAP-$C_4H_{11}O_2$)	57677-98-2
10:2 monoPAP, its salts	10:2 Fluortelomerphosphatemonoester)(10:2 monoPAP)	57678-05-4
	10:2 Fluorotelomer diammonium dihydrogen phosphate	93857-45-5
	3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10, 11,11,12.12,12-Henicosafluorododecyl dihydrogen phosphate cyclohexylamine	2514858-66-1

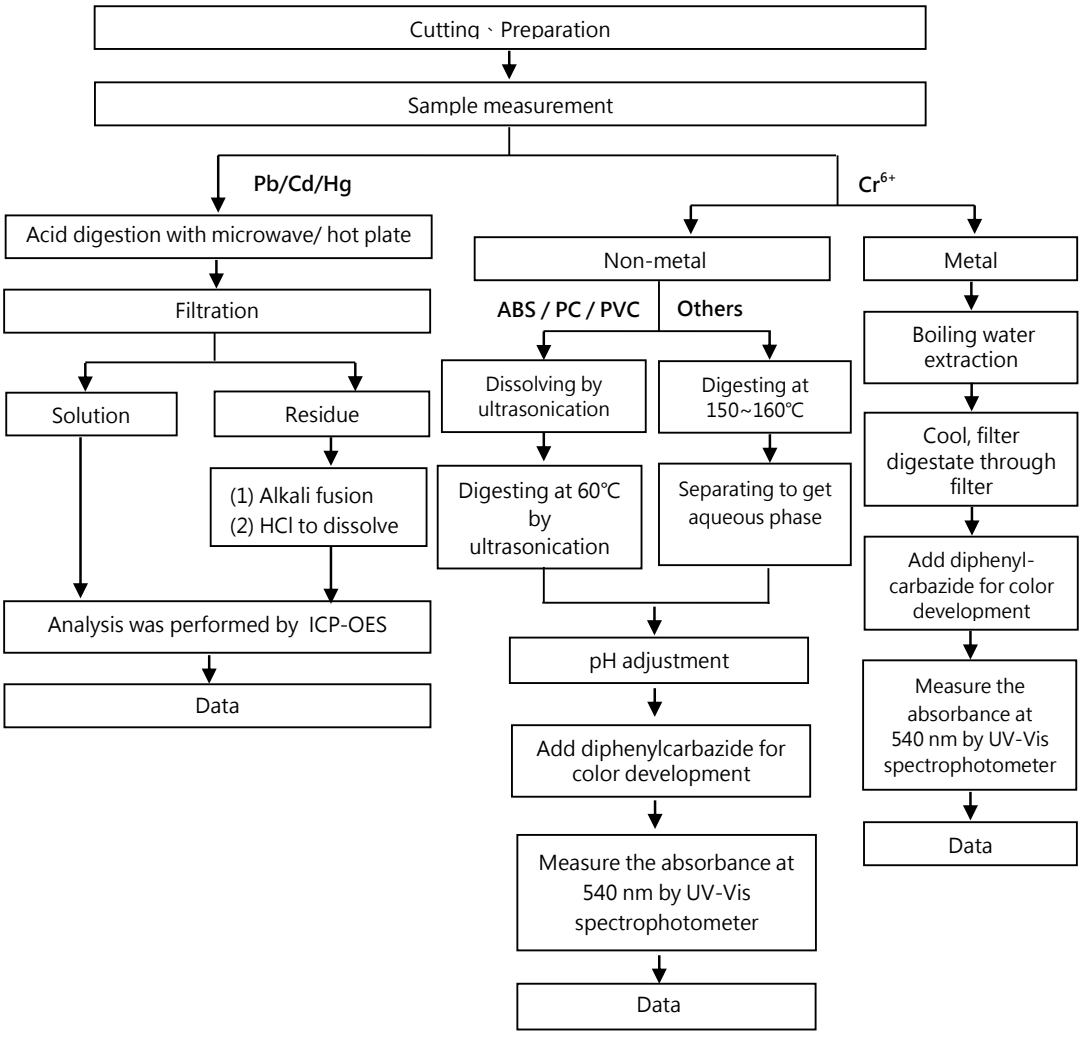
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NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

Analytical flow chart of heavy metal

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

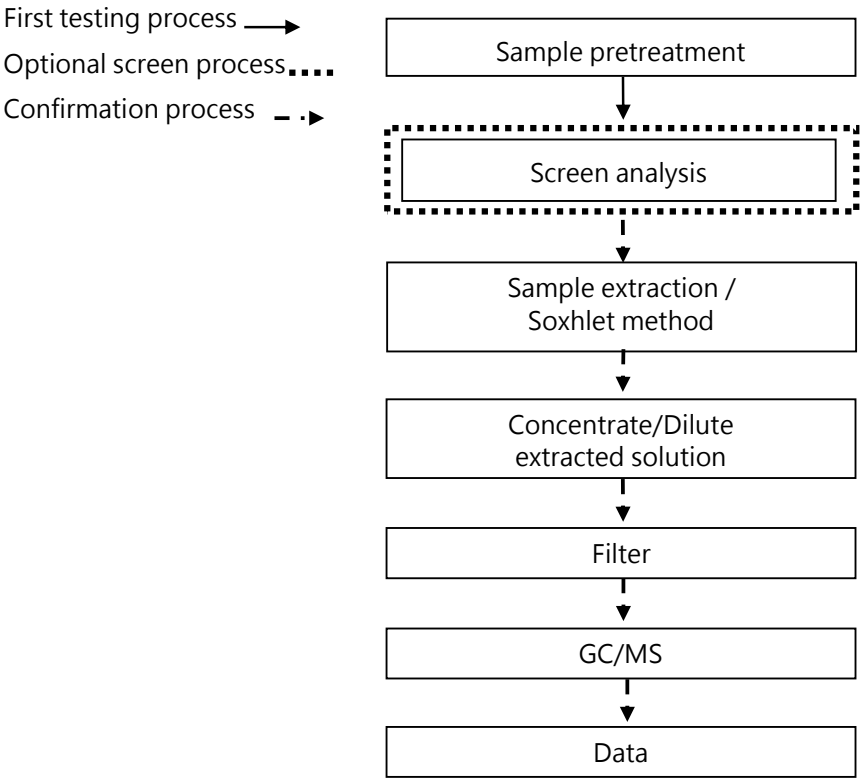
(Cr^{6+} test method excluded)



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NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

Analytical flow chart – PBBs / PBDEs

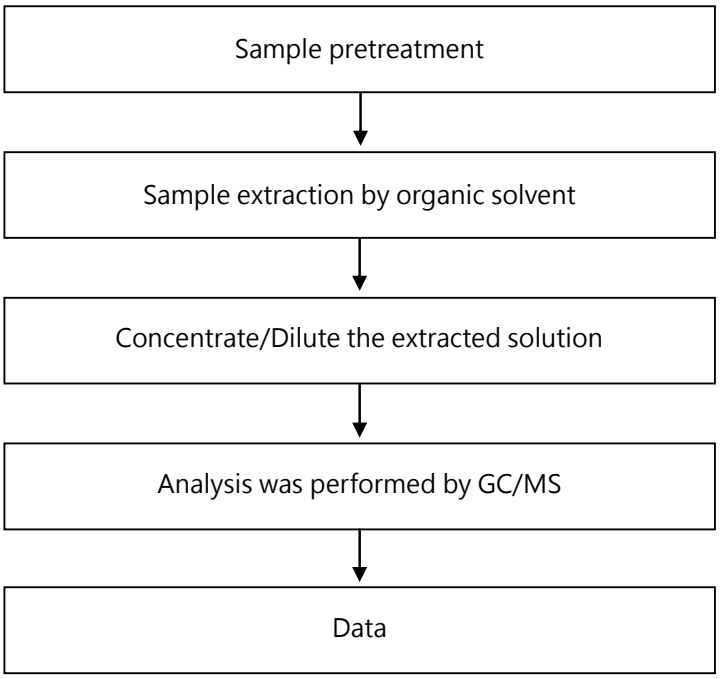


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NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

Analytical flow chart

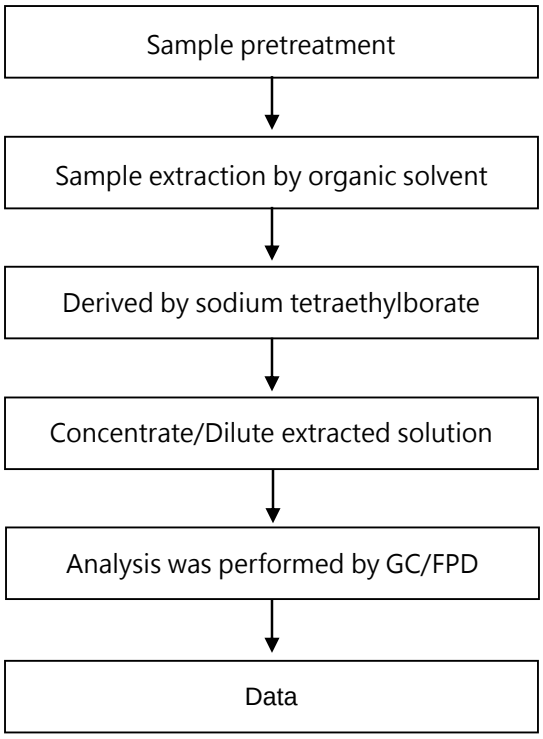
* Apply to: PCBs, PCNs, PCTs, Mirex, Chlorinated Paraffins, DBBT



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NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

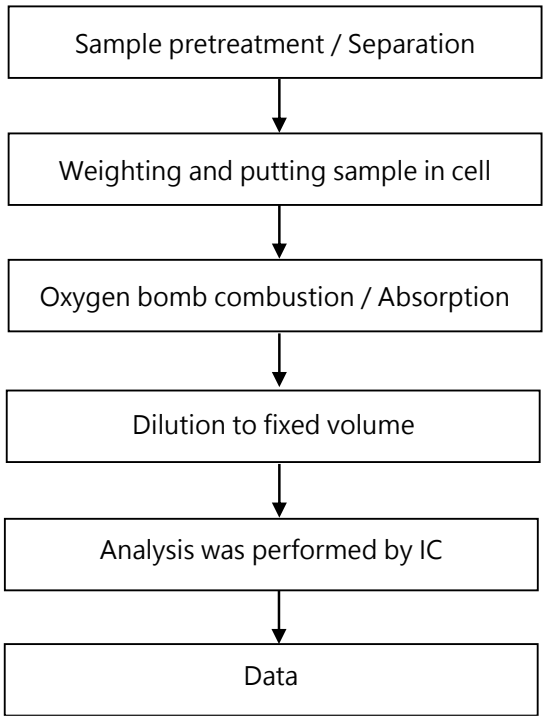
Analytical flow chart - Organic-Tin



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NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

Analytical flow chart - Halogen



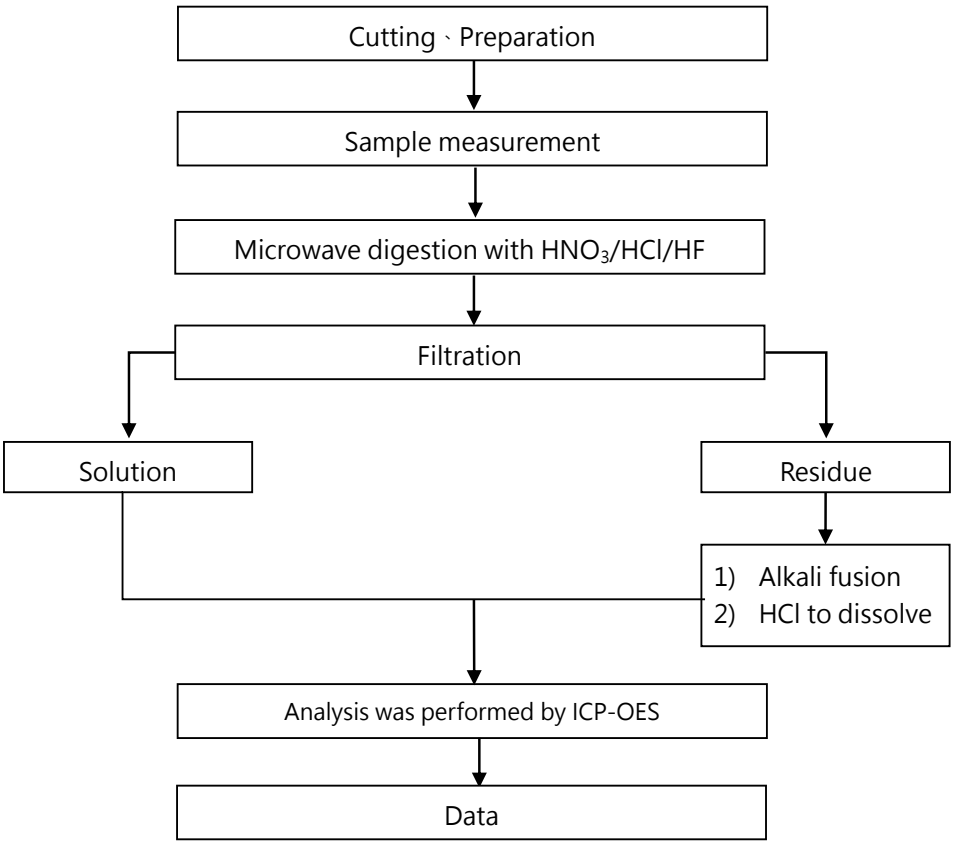
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NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

Analytical flow chart of elements (Heavy metal included)

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

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

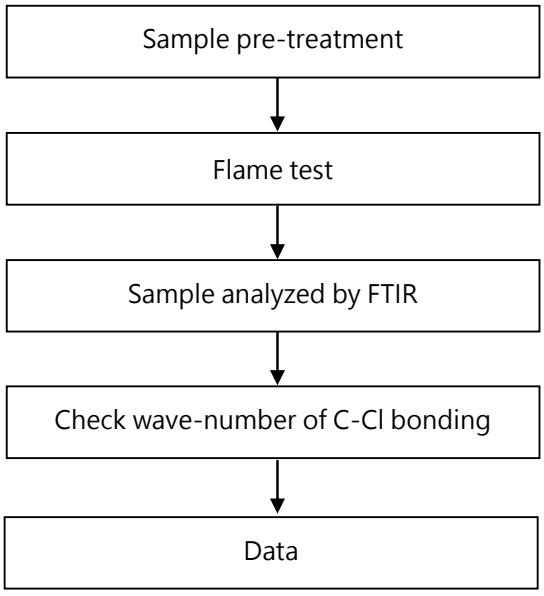


* US EPA 3051A method does not add HF.

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NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

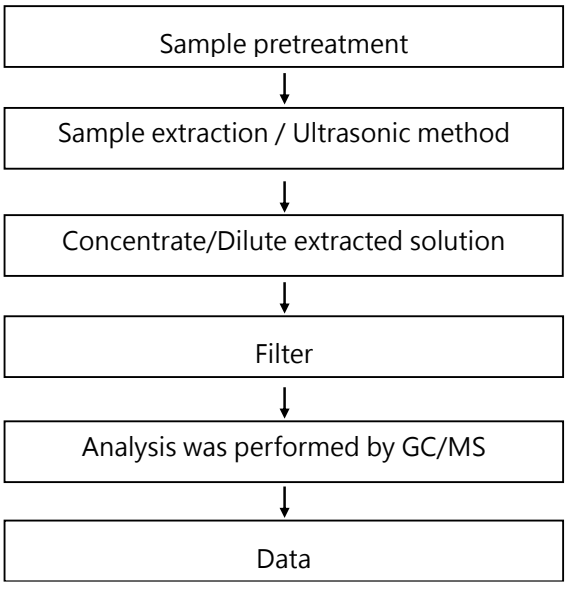
Analysis flow chart - PVC



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NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

Analytical flow chart - HBCDD

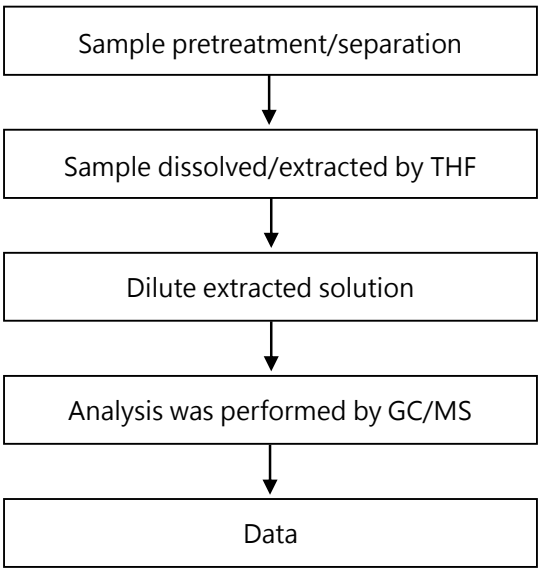


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NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

Analytical flow chart - Phthalate

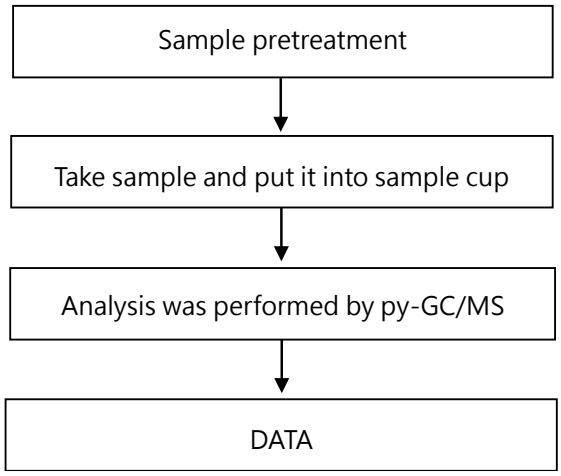
【Test method: IEC 62321-8】



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NIPPON MICROMETAL CORPORATION
158-1, SAYAMAGAHARA IRUMA-CITY, SAITAMA 358-0032, JAPAN

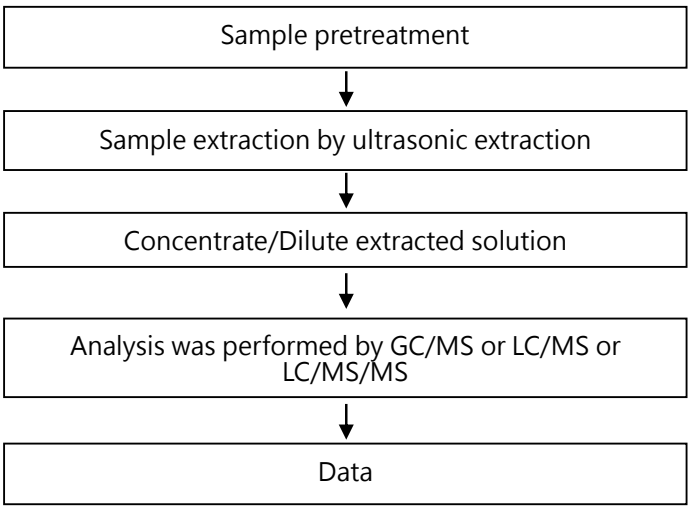
Analytical flow chart - Red phosphorus



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

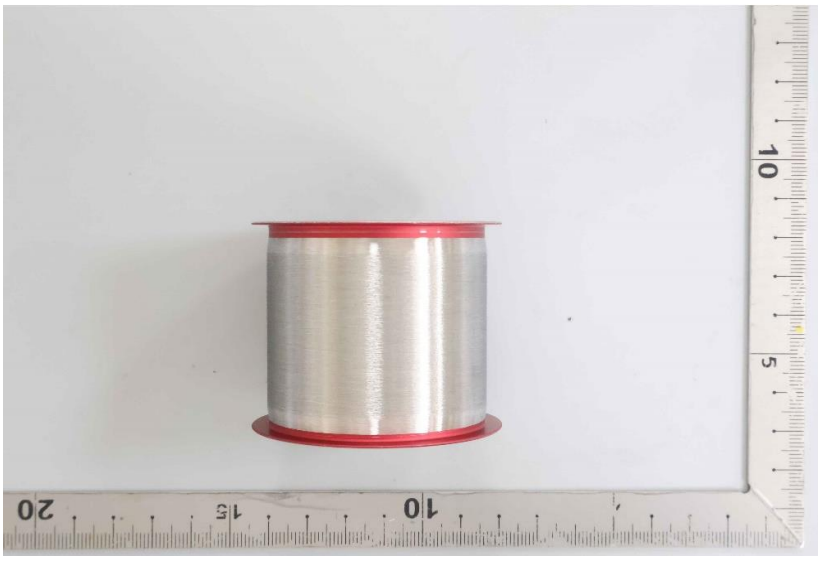


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*** The tested sample / part is marked by an arrow if it's shown on the photo. ***

ETR25B02790



** End of Report **

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Test Report

No.: ETR26100002 Date: 13-Jan-2026

Vanguard International Semiconductor Corporation
No. 123, Park Ave-3rd., Hsinchu Science Park, Hsinchu, Taiwan, R. O. C.

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

Sample Submitted By : Vanguard International Semiconductor Corporation
Sample Name : 2026 VIS FINISHED WAFER
Style/Item No. : FAB1 FINISHED WAFER

==========

Sample Receiving Date : 02-Jan-2026
Testing Period : 02-Jan-2026 to 13-Jan-2026

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 TSCA section 6 and 40 CFR Part 751. Please refer to result table for testing items.
(3) As specified by client, to test PAHs and 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 results of PBTs comply with the limits as set by TSCA section 6 and 40 CFR Part 751.
(3) Based upon the performed tests on the submitted sample(s), the test results of PAHs (15 items) comply with the limits of PAHs requirement (Category 3)「Other consumer products」 as set by German Committee on Product Safety (AfPS) GS PAHs.

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

PIN CODE: 4B32CF3A

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Vanguard International Semiconductor Corporation
No. 123, Park Ave-3rd., Hsinchu Science Park, Hsinchu, Taiwan, R. O. C.

Test Part Description

No.1 : WAFER

Test Result(s)

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

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Vanguard International Semiconductor Corporation
No. 123, Park Ave-3rd., Hsinchu Science Park, Hsinchu, Taiwan, R. O. C.

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Butyl benzyl phthalate (BBP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Dibutyl phthalate (DBP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Di-(2-ethylhexyl) phthalate (DEHP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Diisobutyl phthalate (DIBP)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	1000
Diisodecyl phthalate (DIDP) (CAS No.: 26761-40-0, 68515-49-1)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Diisononyl phthalate (DINP) (CAS No.: 28553-12-0, 68515-48-0)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Di-n-octyl phthalate (DNOP) (CAS No.: 117-84-0)	With reference to IEC 62321-8: 2017, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α- HBCDD, β- HBCDD, γ-HBCDD) (CAS No.: 25637-99-4, 3194-55-6 (134237-51-7, 134237-50-6, 134237-52-8))	With reference to IEC 62321-9: 2021, analysis was performed by GC/MS.	mg/kg	20	n.d.	-
Polychlorinated biphenyls (PCBs)	With reference to US EPA 8082A: 2007, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-
Polychlorinated naphthalene (PCNs)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	5	n.d.	-
Polychlorinated terphenyls (PCTs)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	0.5	n.d.	-
Short Chain Chlorinated Paraffins(C10-C13) (SCCP) (CAS No.: 85535-84-8)	With reference to ISO 18219-1: 2021, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Tetrabromobisphenol A (TBBP-A) (CAS No.: 79-94-7)	With reference to RSTS-E&E-121, analysis was performed by LC/MS.	mg/kg	10	n.d.	-
AZO Dyes					
4-aminobiphenyl (CAS No.: 92-67-1)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-

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Vanguard International Semiconductor Corporation
No. 123, Park Ave-3rd., Hsinchu Science Park, Hsinchu, Taiwan, R. O. C.

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

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Vanguard International Semiconductor Corporation
No. 123, Park Ave-3rd., Hsinchu Science Park, Hsinchu, Taiwan, R. O. C.

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
2-methoxy-5-methylaniline (CAS No.: 120-71-8)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-
4,4'-methylene-bis-(2-chloroaniline) (CAS No.: 101-14-4)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-
4,4'-oxydianiline (CAS No.: 101-80-4)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-
4,4'-thiodianiline (CAS No.: 139-65-1)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-
o-toluidine (CAS No.: 95-53-4)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-
2,4-diaminotoluene (CAS No.: 95-80-7)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-
2,4,5-trimethylaniline (CAS No.: 137-17-7)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-
o-anisidine (CAS No.: 90-04-0)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-
4-aminoazobenzene (CAS No.: 60-09-3)	With reference to EN ISO 14362-1: 2017 or/and EN ISO 14362-3: 2017, analysis was performed by GC/MS & HPLC/DAD.	mg/kg	3	n.d.	-
2,4-xylidine (CAS No.: 95-68-1)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-
2,6-xylidine (CAS No.: 87-62-7)	With reference to EN ISO 14362-1: 2017, analysis was performed by GC/MS and HPLC/DAD.	mg/kg	3	n.d.	-
Polyvinyl chloride (PVC)	With reference to ASTM E1252: 2021, analysis was performed by FT-IR and Flame Test.	**	-	Negative	-

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Vanguard International Semiconductor Corporation
No. 123, Park Ave-3rd., Hsinchu Science Park, Hsinchu, Taiwan, R. O. C.

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Formaldehyde (CAS No.: 50-00-0)	With reference to ISO 17226-1: 2021, analysis was performed by LC/DAD.	mg/kg	3	n.d.	-
Silver(Ag) (CAS No.: 7440-22-4)	With reference to US EPA 3052: 1996, analysis was performed by ICP-MS.	mg/kg	1	n.d.	-
Arsenic(As) (CAS No.: 7440-38-2)	With reference to US EPA 3052: 1996, analysis was performed by ICP-MS.	mg/kg	1	n.d.	-
Beryllium(Be) (CAS No.: 7440-41-7)	With reference to US EPA 3052: 1996, analysis was performed by ICP-MS.	mg/kg	1	n.d.	-
Indium(In) (CAS No.: 7440-74-6)	With reference to US EPA 3052: 1996, analysis was performed by ICP-MS.	mg/kg	1	n.d.	-
Nickel(Ni) (CAS No.: 7440-02-0)	With reference to US EPA 3052: 1996, analysis was performed by ICP-MS.	mg/kg	1	n.d.	-
Platinum(Pt) (CAS No.: 7440-06-4)	With reference to US EPA 3052: 1996, analysis was performed by ICP-MS.	mg/kg	1	n.d.	-
Antimony(Sb) (CAS No.: 7440-36-0)	With reference to US EPA 3052: 1996, analysis was performed by ICP-MS.	mg/kg	1	n.d.	-
Fluorine (F) (CAS No.: 14762-94-8)	With reference to BS EN 14582: 2016 modified, analysis was performed by IC.	mg/kg	20	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.	-
Tributyl tin (TBT)	With reference to ISO 17353: 2004, analysis was performed by GC/FPD.	mg/kg	0.03	n.d.	-
Triphenyl tin (TPT)	With reference to ISO 17353: 2004, analysis was performed by GC/FPD.	mg/kg	0.03	n.d.	-
Dibutyl tin (DBT)	With reference to ISO 17353: 2004, analysis was performed by GC/FPD.	mg/kg	0.03	n.d.	-
Dioctyl tin (DOT)	With reference to ISO 17353: 2004, analysis was performed by GC/FPD.	mg/kg	0.03	n.d.	-
Monobutyl tin (MBT)	With reference to ISO 17353: 2004, analysis was performed by GC/FPD.	mg/kg	0.03	n.d.	-
Tetrabutyl tin (TeBT)	With reference to ISO 17353: 2004, analysis was performed by GC/FPD.	mg/kg	0.03	n.d.	-

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Vanguard International Semiconductor Corporation
No. 123, Park Ave-3rd., Hsinchu Science Park, Hsinchu, Taiwan, R. O. C.

Test Item(s)	Method	Unit	MDL	Result No.1	Limit
Monooctyl tin (MOT)	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.	-
2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (CAS No.: 15571-58-1)	Calculated from the result of Dioctyl Tin (DOT).	mg/kg	0.03▲	n.d.	-
Reaction mass of 2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate and 2-ethylhexyl 10-ethyl-4-[[2-[(2-ethylhexyl)oxy]-2-oxoethyl]thio]-4-octyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (reaction mass of DOTE and MOTE)	Calculated from the results of Dioctyl Tin (DOT) and Monooctyl Tin (MOT).	mg/kg	0.03▲	n.d.	-
Uranium (U) (Radioactive element) (CAS No.: 7440-61-1)	With reference to US EPA 3052: 1996 & 6020B: 2014, analysis was performed by ICP-MS.	mg/kg	1	n.d.	-
Thorium (Th) (Radioactive element) (CAS No.: 7440-29-1)	With reference to US EPA 3052: 1996 & 6020B: 2014, analysis was performed by ICP-MS.	mg/kg	1	n.d.	-
Strontium (Sr) (Radioactive element) (CAS No.: 7440-24-6)	With reference to US EPA 3052: 1996 & 6020B: 2014, analysis was performed by ICP-MS.	mg/kg	1	n.d.	-
Caesium (Cs) (Radioactive element) (CAS No.: 7440-46-2)	With reference to US EPA 3052: 1996 & 6020B: 2014, analysis was performed by ICP-MS.	mg/kg	1	n.d.	-
Medium Chain Chlorinated Paraffins(C14-C17) (MCCP) (CAS No.: 85535-85-9)	With reference to ISO 18219-2: 2021, analysis was performed by GC/MS.	mg/kg	50	n.d.	-
Perfluorooctane sulfonates and its salts (PFOS and its salts) (CAS No.: 1763-23-1 and its salts)	Modified EN 17681-1: 2025, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-
Perfluorooctanoic acid and its salts (PFOA and its salts) (CAS No.: 335-67-1 and its salts)	Modified EN 17681-1: 2025, analysis was performed by LC/MS/MS.	mg/kg	0.01	n.d.	-

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Vanguard International Semiconductor Corporation
No. 123, Park Ave-3rd., Hsinchu Science Park, Hsinchu, Taiwan, R. O. C.

Test Item(s)	Method	Unit	MDL	Result No.1	Limit
Polycyclic Aromatic Hydrocarbons (PAHs)					
Benzo[a]pyrene (CAS No.: 50-32-8)	With reference to AfPS GS 2019:01 PAK, analysis was performed by GC/MS.	mg/kg	0.2	n.d.	Δ
Benzo[e]pyrene (CAS No.: 192-97-2)		mg/kg	0.2	n.d.	Δ
Benzo[a]anthracene (CAS No.: 56-55-3)		mg/kg	0.2	n.d.	Δ
Benzo[b]fluoranthene (CAS No.: 205-99-2)		mg/kg	0.2	n.d.	Δ
Benzo[j]fluoranthene (CAS No.: 205-82-3)		mg/kg	0.2	n.d.	Δ
Benzo[k]fluoranthene (CAS No.: 207-08-9)		mg/kg	0.2	n.d.	Δ
Chrysene (CAS No.: 218-01-9)		mg/kg	0.2	n.d.	Δ
Dibenzo[a,h]anthracene (CAS No.: 53-70-3)		mg/kg	0.2	n.d.	Δ
Benzo[g,h,i]perylene (CAS No.: 191-24-2)		mg/kg	0.2	n.d.	Δ
Indeno[1,2,3-c,d]pyrene (CAS No.: 193-39-5)		mg/kg	0.2	n.d.	Δ
Anthracene (CAS No.: 120-12-7)		mg/kg	0.2	n.d.	Δ
Fluoranthene (CAS No.: 206-44-0)		mg/kg	0.2	n.d.	Δ
Phenanthrene (CAS No.: 85-01-8)		mg/kg	0.2	n.d.	Δ
Pyrene (CAS No.: 129-00-0)		mg/kg	0.2	n.d.	Δ
Naphthalene (CAS No.: 91-20-3)		mg/kg	0.2	n.d.	Δ
Sum of 15 PAHs		mg/kg	-	n.d.	Δ
Acenaphthylene (CAS No.: 208-96-8)	With reference to AfPS GS 2019:01 PAK, analysis was performed by GC/MS.	mg/kg	0.2	n.d.	-
Acenaphthene (CAS No.: 83-32-9)		mg/kg	0.2	n.d.	-
Fluorene (CAS No.: 86-73-7)		mg/kg	0.2	n.d.	-
2-Ethoxyethyl acetate (CAS No.: 111-15-9)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	10	n.d.	-
Ethylene glycol monomethyl ether acetate (CAS No.: 110-49-6)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	10	n.d.	-
Ethylene glycol monomethyl ether (CAS No.: 109-86-4)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	10	n.d.	-
2-Ethoxyethanol (CAS No.: 110-80-5)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	10	n.d.	-

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Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Diethylene glycol dimethyl ether (DEGDME) (CAS No.: 111-96-6)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	10	n.d.	-
1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich (DIHP) (CAS No.: 71888-89-6)	With reference to EN 14372: 2004, analysis was performed by GC/MS.	mg/kg	100	n.d.	-
1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters (DHNUP) (CAS No.: 68515-42-4)	With reference to EN 14372: 2004, analysis was performed by GC/MS.	mg/kg	100	n.d.	-
Bis(2-methoxyethyl) phthalate (DMEP) (CAS No.: 117-82-8)	With reference to EN 14372: 2004, analysis was performed by GC/MS.	mg/kg	30	n.d.	-
Di-n-heptyl phthalate (CAS No.: 3648-21-3)	With reference to EN 14372: 2004, analysis was performed by GC/MS.	mg/kg	30	n.d.	-
Diisopentyl phthalate (DIPP) (CAS No.: 605-50-5)	With reference to EN 14372: 2004, analysis was performed by GC/MS.	mg/kg	30	n.d.	-
1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linear (DHP) (CAS No.: 68515-50-4)	With reference to EN 14372: 2004, analysis was performed by GC/MS.	mg/kg	100	n.d.	-
N-pentyl iso-pentyl phthalate (NPIPP) (CAS No.: 776297-69-9)	With reference to EN 14372: 2004, analysis was performed by GC/MS.	mg/kg	30	n.d.	-
Di-cyclohexyl phthalate (DCHP) (CAS No.: 84-61-7)	With reference to EN 14372: 2004, analysis was performed by GC/MS.	mg/kg	30	n.d.	-
Di-(2-ethylhexyl) phthalate (DEHP) (CAS No.: 117-81-7)	With reference to EN 14372: 2004, analysis was performed by GC/MS.	mg/kg	30	n.d.	-
Di-ethyl phthalate (DEP) (CAS No.: 84-66-2)	With reference to EN 14372: 2004, analysis was performed by GC/MS.	mg/kg	30	n.d.	-
Diisooctyl phthalate (DIOP) (CAS No.: 27554-26-3)	With reference to EN 14372: 2004, analysis was performed by GC/MS.	mg/kg	100	n.d.	-
Dimethyl phthalate (DMP) (CAS No.: 131-11-3)	With reference to EN 14372: 2004, analysis was performed by GC/MS.	mg/kg	30	n.d.	-
Di-n-nonyl phthalate (DNNP) (CAS No.: 84-76-4)	With reference to EN 14372: 2004, analysis was performed by GC/MS.	mg/kg	30	n.d.	-
Di-n-pentyl phthalate (DNPP) (CAS No.: 131-18-0)	With reference to EN 14372: 2004, analysis was performed by GC/MS.	mg/kg	30	n.d.	-
Dipropyl phthalate (DPrP) (CAS No.: 131-16-8)	With reference to EN 14372: 2004, analysis was performed by GC/MS.	mg/kg	30	n.d.	-

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Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Di-2-ethylhexyl adipate (DEHA) (CAS No.: 103-23-1)	With reference to EN 14372: 2004, analysis was performed by GC/MS.	mg/kg	30	n.d.	-
Perchlorate (CAS No.: 14797-73-0)	Analysis was performed by IC.	μg/g	0.1	n.d.	-
Nonylphenol (NP)	With reference to US EPA 3550C: 2007, analysis was performed by LC/MS.	mg/kg	10	n.d.	-
Tris(2-chloroethyl) phosphate (TCEP) (CAS No.: 115-96-8)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	5	n.d.	-
Tris(1-chloro-2-propyl) phosphate (TCPP) (CAS No.: 13674-84-5)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	5	n.d.	-
Tris(1,3-dichloro-2-propyl) phosphate (CAS No.: 13674-87-8)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	5	n.d.	-
Trixylyl phosphate (CAS No.: 25155-23-1)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	25	n.d.	-
4-Tert-octylphenol (CAS No.: 140-66-9)	With reference to US EPA 3550C: 2007, analysis was performed by LC/MS.	mg/kg	10	n.d.	-
N,N-Dimethylacetamide (DMAC) (CAS No.: 127-19-5)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	10	n.d.	-
Phosphorus (P) (CAS No.: 7723-14-0)	With reference to US EPA 3052: 1996, analysis was performed by ICP-OES.	mg/kg	2	4.49	-
TBBP-A-bis (CAS No.: 21850-44-2)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	5	n.d.	-
Benzenamine, N-phenyl-, reaction products with styrene and 2,4,4-trimethylpentene (CAS No.: 68921-45-9)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	100	n.d.	-
2-benzotriazol-2-yl-4,6-di-tert-butylphenol (UV-320) (CAS No.: 3846-71-7)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	5	n.d.	-
2-(2H-benzotriazol-2-yl)-4,6-ditertpentylphenol (UV-328) (CAS No.: 25973-55-1)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Di-n-hexyl phthalate (DNHP) (CAS No.: 84-75-3)	With reference to EN 14372: 2004, analysis was performed by GC/MS.	mg/kg	30	n.d.	-
Dimethyl fumarate (DMFu) (CAS No.: 624-49-7)	With reference to US EPA 3550C: 2007, analysis was performed by GC/MS.	mg/kg	0.1	n.d.	-

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Test Item(s)	Method	Unit	MDL	Result No.1	Limit
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	-
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.	1000 / 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.	1000 / 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
Chlorofluorocarbons (CFCs)					
CFC-13	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
CFC-111	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
CFC-112	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
CFC-211	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
CFC-212	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
CFC-213	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
CFC-214	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
CFC-215	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
CFC-216	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-

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Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
CFC-217	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
CFC-12	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
CFC-11	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
CFC-115	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
CFC-114	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
CFC-113	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Hydrochlorofluorocarbons (HCFCs)					
HCFC-21	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-22	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-31	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-121	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-122	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-123	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-124	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-131	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-142b	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-221	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-222	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-

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Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
HCFC-223	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-224	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-225ca	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-225cb	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-226	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-231	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-232	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-233	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-234	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-235	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-241	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-242	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	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-252	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-261	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-262	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-271	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-

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Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
HCFC-141b	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-243	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-253	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.	-
HCFC-133	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HCFC-132	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
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.	-
Halon-1202 (CAS No.: 75-61-6)	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	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-262B1	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-261B2	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-

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Vanguard International Semiconductor Corporation
No. 123, Park Ave-3rd., Hsinchu Science Park, Hsinchu, Taiwan, R. O. C.

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
HBFC-253B1	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-252B2	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-244B1	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-243B2	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-242B3	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-241B4	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-235B1	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-234B2	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-233B3	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-232B4	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-231B5	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-226B1	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-225B2	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-224B3	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-223B4	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-222B5	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-221B6	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-151B1	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-

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Vanguard International Semiconductor Corporation
No. 123, Park Ave-3rd., Hsinchu Science Park, Hsinchu, Taiwan, R. O. C.

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
HBFC-142B1	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-141B2	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-133B1	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-132B2	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-131B3	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-124B1	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-123B2	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-122B3	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-121B4	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-31B1	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-22B1	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-21B2	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HBFC-251B1	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Hydrofluorocarbon (HFCs)					
HFC-23	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HFC-32	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HFC-41	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HFC-43-10mee	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-

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Vanguard International Semiconductor Corporation
No. 123, Park Ave-3rd., Hsinchu Science Park, Hsinchu, Taiwan, R. O. C.

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
HFC-125	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HFC-134	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HFC-134a	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HFC-143	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HFC-143a	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HFC-152a	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HFC-227ea	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HFC-236fa	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HFC-245ca	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HFC-245fa	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HFC-365mfc	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HFC-236ea	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HFC-236cb	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HFC-161	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
HFC-152	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Perfluorocarbon (PFCs)					
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.	-

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Vanguard International Semiconductor Corporation
No. 123, Park Ave-3rd., Hsinchu Science Park, Hsinchu, Taiwan, R. O. C.

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Freon-14 (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.	-
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.	-
Perfluorodecalin (CAS No.: 306-94-5)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
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.	-

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No. 123, Park Ave-3rd., Hsinchu Science Park, Hsinchu, Taiwan, R. O. C.

Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Dichloromethane (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.	-
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.	-
1-Bromopropane (CAS No.: 106-94-5)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
Bromoethane (CAS No.: 74-96-4)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-

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Test Item(s)	Method	Unit	MDL	Result	Limit
				No.1	
Trifluoroiodomethane (CAS No.: 2314-97-8)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-
2-Bromo-3,3,3-trifluoroprop-1-ene (CAS No.: 1514-82-5)	With reference to US EPA 5021A: 2014, analysis was performed by GC/MS.	mg/kg	1	n.d.	-

Note：

1. mg/kg = ppm ; 0.1wt% = 0.1% = 1000ppm
2. MDL = Method Detection Limit
3. n.d. = Not Detected (Less than MDL)
4. "-" = Not Regulated
5. **= Qualitative analysis (No Unit)
6. Negative = Undetectable ; Positive = Detectable
7. Testing range of asbestos qualitative analysis is from less than 0.1% to 100%. The judgment criterion: asbestos fibers being found is shown as "Positive"; asbestos fibers not being found is shown as "Negative".
8. ▲ : 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
2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (DOTE)	Dioctyl Tin (DOT)	2.1782

   Parameter Conversion Table： https://eecloud.sgs.com/Region_TW/DocDownload.aspx?name=Others
9. Unless otherwise stated , the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule (w=0) stated in ILAC-G8:09/2019. According to this rule, the judgement of conformity is based on the comparing test results with limits.
10. Detail explanation of the regulation is available at the following link.
    https://www.ecfr.gov/current/title-40/chapter-I/subchapter-R/part-751?toc=1

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11. 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
    - Distribution in commerce of PIP (3:1)-containing articles before October 31, 2026
    - Circuit boards and wire harnesses, including but not limited to terminal and fuse covers, cable sleeves, casings, connectors, and tapes
    - Articles that contain PIP (3:1), and where PIP (3:1) has not been newly added, for the purpose of repair or maintenance
    - New manufacturing equipment, including in the semiconductor industry, for new heating, ventilation, air-conditioning, refrigeration, and water-heating equipment, new power generating equipment, new laboratory equipment, new commercial electronic equipment
12. N/A(*2) : The submitted sample is exempted from the regulated scope if it is not oil and lubricant additives.
13. 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.

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No. 123, Park Ave-3rd., Hsinchu Science Park, Hsinchu, Taiwan, R. O. C.

PAHs Remark：

Δ AfPS (German commission for Product Safety): GS PAHs requirements

Parameter	Category 1	Category 2		Category 3	
	Materials intended to be placed in the mouth, or materials in toys (Directive 2009/48/EC) or articles for children up to 3 years of age with intended long-term skin contact (> 30 seconds).	Materials that are not in Category 1, with intended or foreseeable long-term skin contact (> 30 seconds) or short-term repetitive contact with the skin.		Materials not covered by Category 1 or 2, with intended or foreseeable short-term skin contact (≦30 seconds).	
		a. Use by children under 14	b. Other consumer products	a. Use by children under 14	b. Other consumer products
Naphthalene	< 1	< 2		< 10	
Phenanthrene	< 1 Sum	< 5 Sum	< 10 Sum	< 20 Sum	< 50 Sum
Anthracene					
Fluoranthene					
Pyrene					
Benzo[a]anthracene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Chrysene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo[b]fluoranthene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo[j]fluoranthene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo[k]fluoranthene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo[a]pyrene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo[e]pyrene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Indeno[1,2,3-c,d] pyrene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Dibenzo[a,h]anthracene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Benzo[g,h,i]perylene	< 0.2	< 0.2	< 0.5	< 0.5	< 1
Sum of 15 PAH	< 1	< 5	< 10	< 20	< 50

Unit：mg/kg

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PFAS Remark：

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

Group Name	Substance Name	CAS No.
PFOS, its salts & derivatives	Perfluorooctane sulfonates (PFOS)	1763-23-1
	Potassium perfluorooctanesulfonate (PFOS-K)	2795-39-3
	Perfluorooctanesulfonic acid, lithium salt (PFOS-Li)	29457-72-5
	Perfluorooctanesulfonic acid, ammonium salt (PFOS-NH_4)	29081-56-9
	Perfluorooctane sulfonate diethanolamine salt (PFOS-NH(C2H4OH)2)	70225-14-8
	Perfluorooctanesulfonic acid,tetraethylammonium salt (PFOS-$N(C_2H_5)_4$)	56773-42-3
	N-decyl-N,N-dimethyldecan-1-aminium 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluorooctane-1-sulfonate (PFOS-DDA)	251099-16-8
	TetrabutylAmmonium perfluorooctanesulfonate (PFOS-$N(C_4H_9)_4$)	111873-33-7
	Perfluorooctane sulfonyl fluoride (POSF)	307-35-7
	Perfluorooctanesulfonic acid, magnesium salt (PFOS-Mg)	91036-71-4
	Perfluorooctanesulfonic acid, sodium salt (PFOS-Na)	4021-47-0
	Piperidine 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluorooctanesulfonate	71463-74-6
	Perfluorooctanesulfonate (anion)	45298-90-6
	1-Octanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-, compd. with N,N-diethylethanamine (1:1) (PFOS-$NH(C_2H_5)_3$)	54439-46-2
	Methanaminium, N,N,N-trimethyl-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1-octanesulfonate (1:1) (PFOS-$N(CH_3)_4$)	56773-44-5
	1-Pentanaminium, N,N,N-tripropyl-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1-octanesulfonate (1:1) (PFOS-$N(C_3H_7)_3(C_5H_{11})$)	56773-56-9
	1-Butanaminium, N,N-dibutyl-N-methyl-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1-octanesulfonate (1:1) (PFOS-$N(C_4H_9)_3(CH_3)$)	124472-68-0

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Group Name	Substance Name	CAS No.
PFOS, its salts & derivatives	Iodonium, bis[4-(1,1-dimethylethyl)phenyl]-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1-octanesulfonate (1:1)	213740-80-8
	Sulfonium, diphenyl(2,4,6-trimethylphenyl)-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1-octanesulfonate (1:1)	258341-99-0
	Pyridinium, 1-hexadecyl-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1-octanesulfonate (1:1)	334529-63-4
	1-Decanaminium, N,N,N-triethyl-, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1-octanesulfonate (1:1)	773895-92-4
	Tetrabutylphosphonium perfluorooctane sulfonate (PFOS-$P(C_4H_9)_4$))	2185049-59-4
	Perfluorooctanesulfonic acid diethylamine salt (PFOS-$C_4H_{11}N$)	2205029-08-7
	Heptyldimethyl{2-[(2-methylprop-2-enoyl)oxy]ethyl}azanium perfluorooctanesulfonate (PFOS-$C_{15}H_{30}NO_2$)	1203998-97-3
	1-Octanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-, 1,1'-anhydride (PFOSAN)	423-92-7
	Perfluoro-1-octanesulfonyl chloride (PFOS-Cl)	423-60-9
PFOA, its salts & derivatives	Perfluorooctanoic acid (PFOA)	335-67-1
	Sodium perfluorooctanoate (PFOA-Na)	335-95-5
	Potassium perfluorooctanoate (PFOA-K)	2395-00-8
	Silver perfluorooctanote (PFOA-Ag)	335-93-3
	Perfluorooctanoyl fluoride (PFOA-F)	335-66-0
	Ammonium pentadecafluorooctanoate (APFO)	3825-26-1
	Lithium perfluorooctanoate (PFOA-Li)	17125-58-5
	Cobalt perfluorooctanoate (PFOA-Co)	35965-01-6
	Cesium perfluorooctanoate (PFOA-Cs)	17125-60-9
	Octanoic acid, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluoro-, chromium(3+) (PFOA-$Cr(3^+)$)	68141-02-6
	Pentadecafluorooctanoic acid--piperazine (2/1)PFOA-$NH(C_4H_{10}N)$	423-52-9
	Pentadecafluorooctanoate (anion)	45285-51-6
	Perfluorooctanoic Anhydride	33496-48-9
	Ethanaminium, N,N,N-triethyl-, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluorooctanoate (1:1)	98241-25-9
	Tetramethylammoniumperfluoroctanoat	32609-65-7
	1-Propanaminium, N,N,N-tripropyl-, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluorooctanoate (1:1)	277749-00-5

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Group Name	Substance Name	CAS No.
PFOA, its salts & derivatives	Octanoic acid, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluoro-, potassium salt, hydrate (1:1:2) (PFOA-K(H_2O)$_2$)	98065-31-7
	Octanoic acid, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluoro-, compd. with ethanamine (1:1) (PFOA-C_2H_7N)	1376936-03-6
	Octanoic acid, pentadecafluoro-, compd. with pyridine (1:1) (9CI) (PFOA-C_5H_5N)	95658-47-2
	Pentadecafluorooctanoic acid- 1-phenylpiperazine(1:1) (PFOA-$C_{10}H_{14}N_2$)	1514-68-7
	1-Octanaminium, N,N,N-trimethyl-, 2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-pentadecafluorooctanoate (1:1) (PFOA- $C_{11}H_{26}N$)	927835-01-6
	Pentadecafluorooctanoyl chloride (PFOA-Cl)	335-64-8
	Perfluorooctanoyl Bromide (PFOA-Br)	222037-87-8

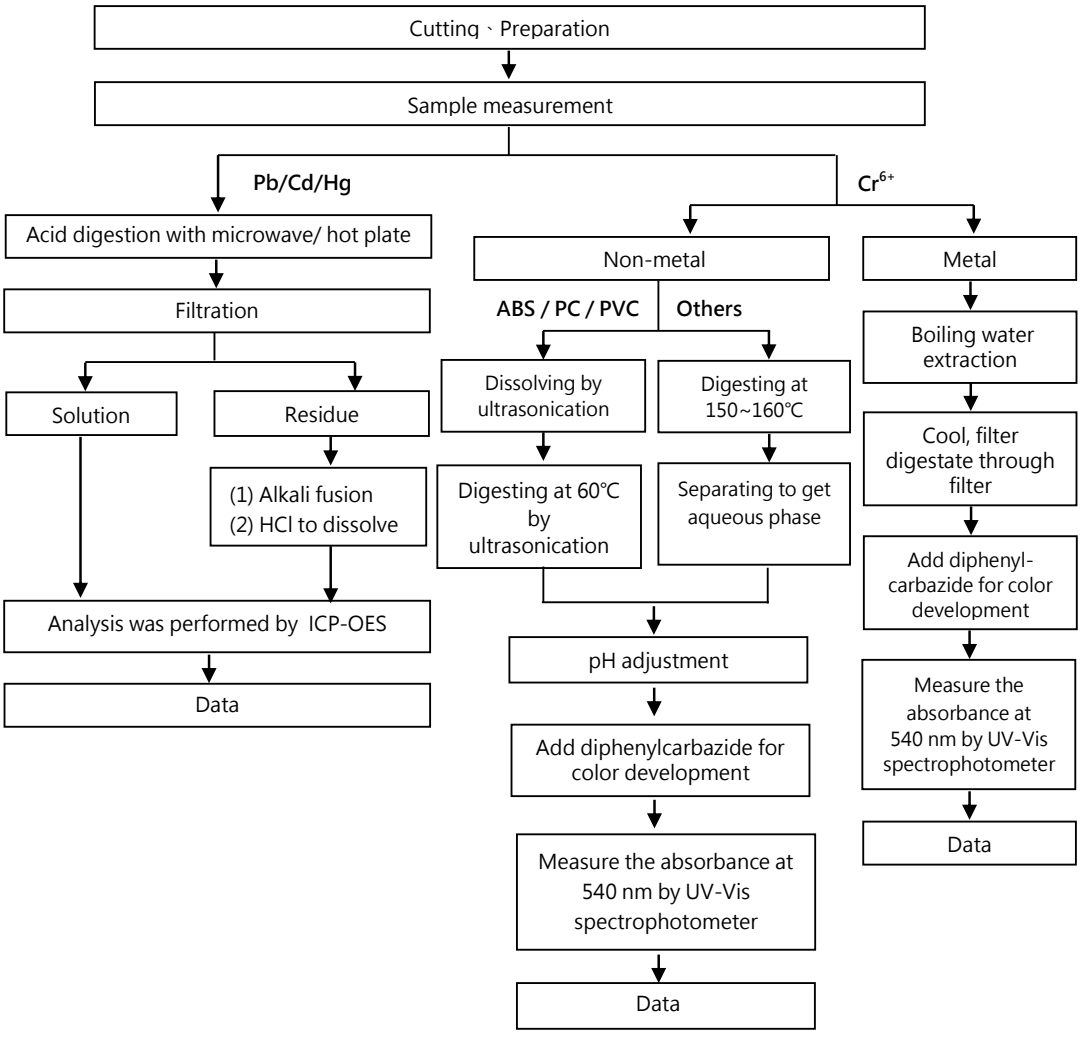
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Analytical flow chart of heavy metal

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

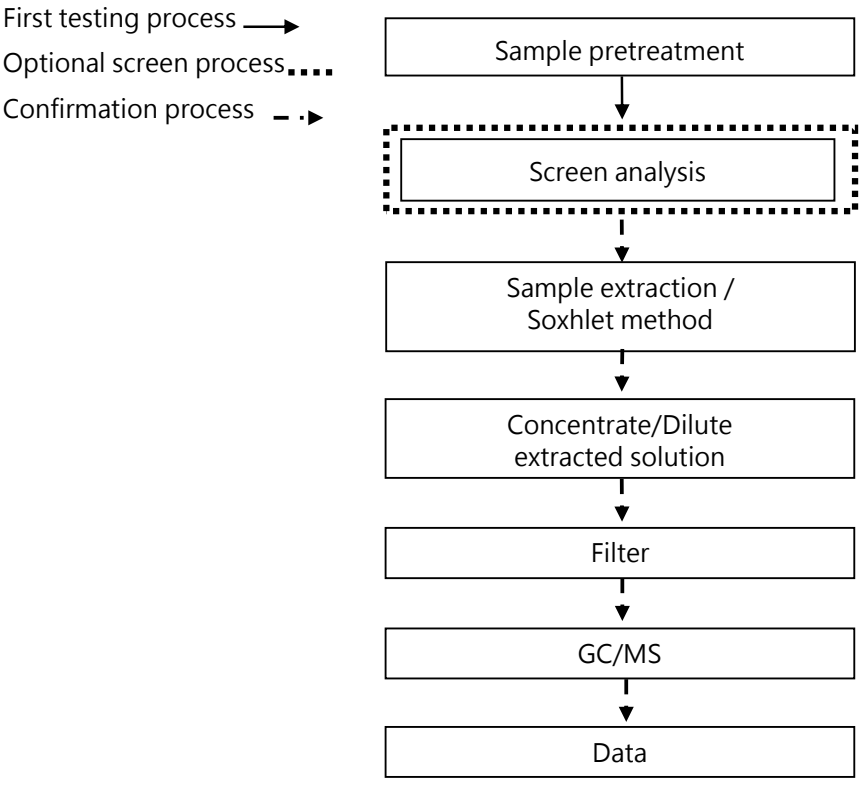
(Cr^{6+} test method excluded)



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Analytical flow chart – PBBs / PBDEs

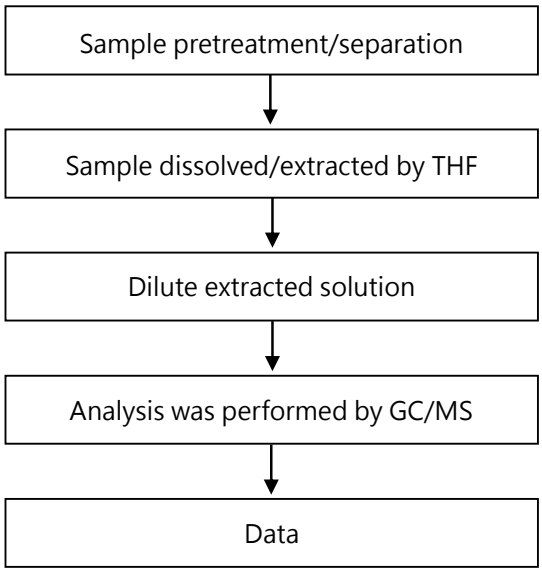


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Analytical flow chart - Phthalate

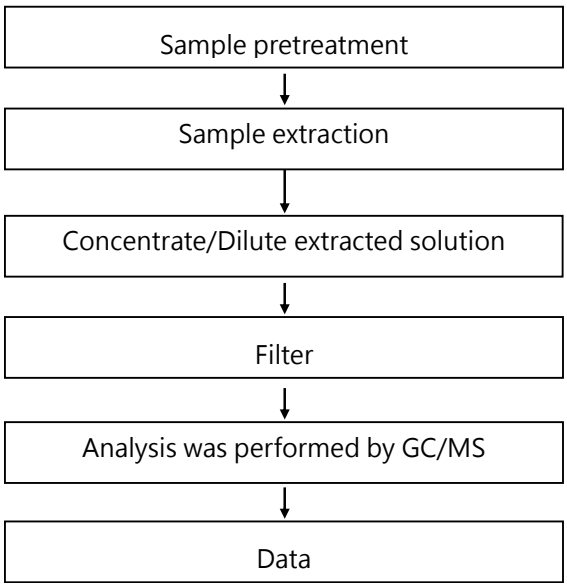
【Test method: IEC 62321-8】



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Analytical flow chart - HBCDD

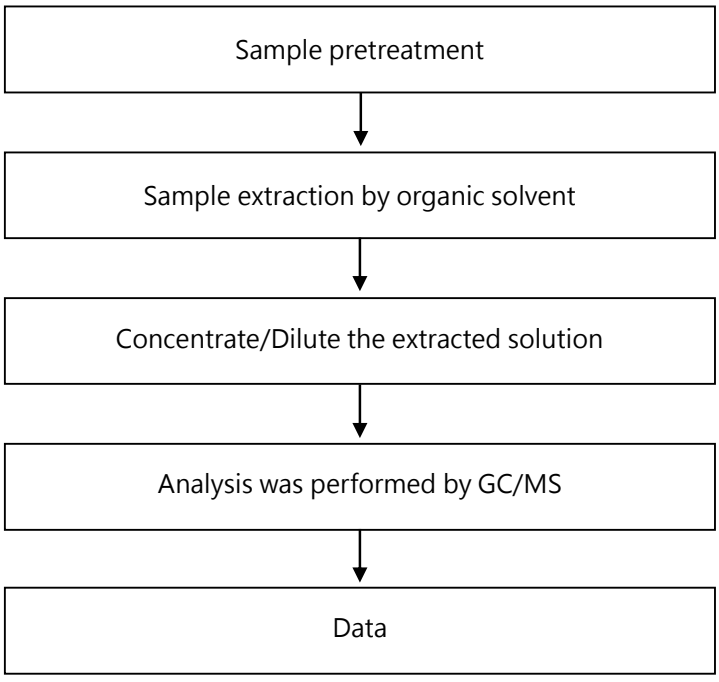


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Analytical flow chart

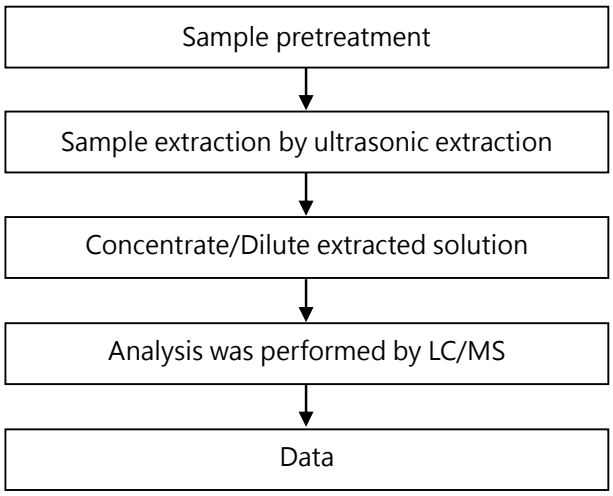
* Apply to: PCBs, PCNs, PCTs, Mirex, Chlorinated Paraffins, DBBT



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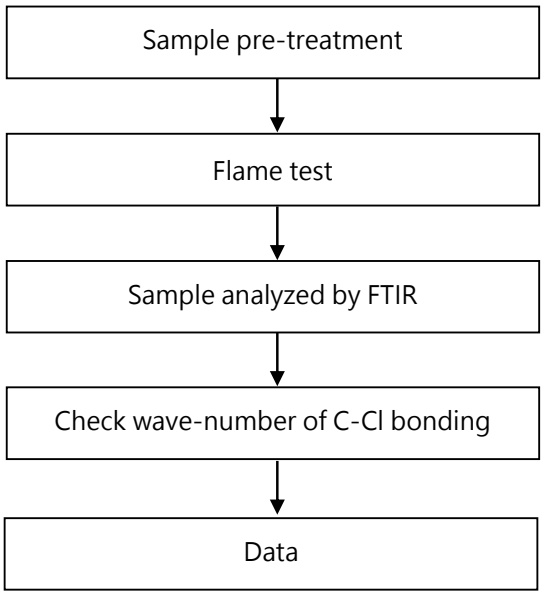
Analytical flow chart - TBBP-A



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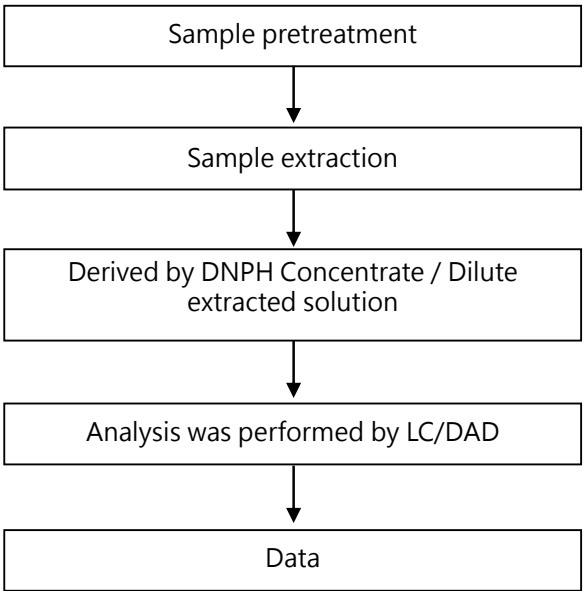
Analysis flow chart - PVC



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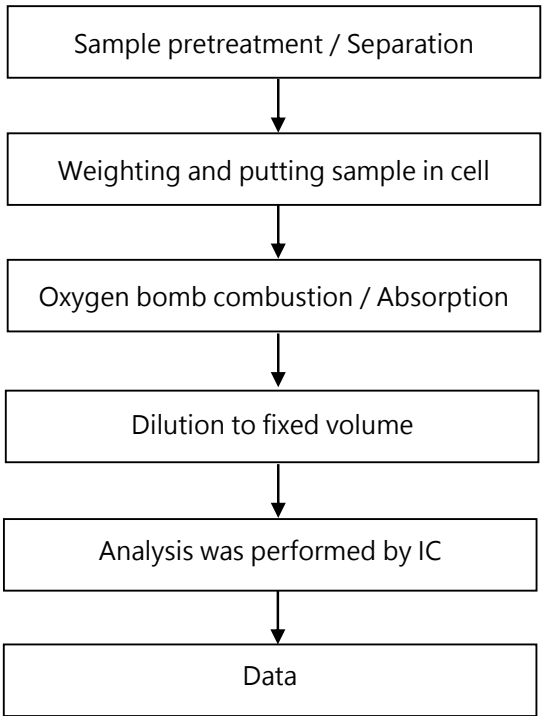
Analytical flow chart - Formaldehyde



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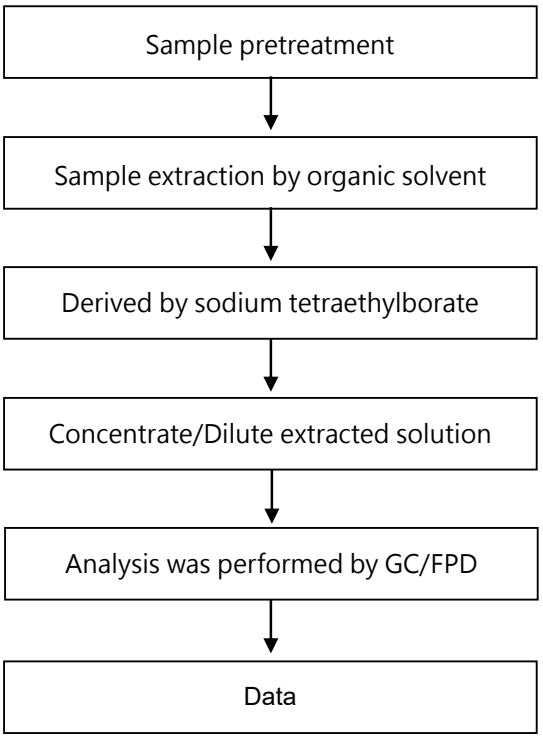
Analytical flow chart - Halogen



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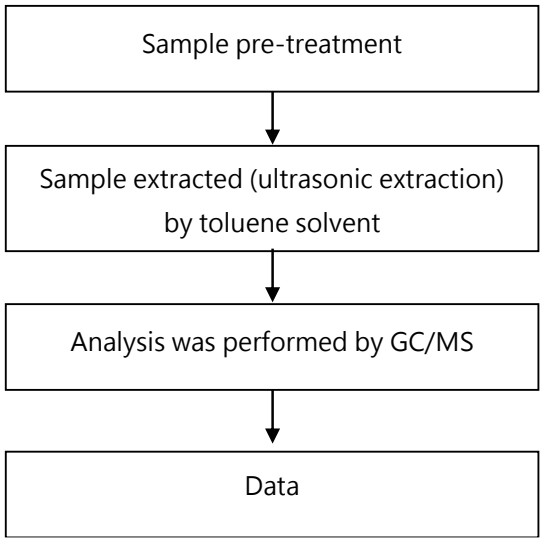
Analytical flow chart - Organic-Tin



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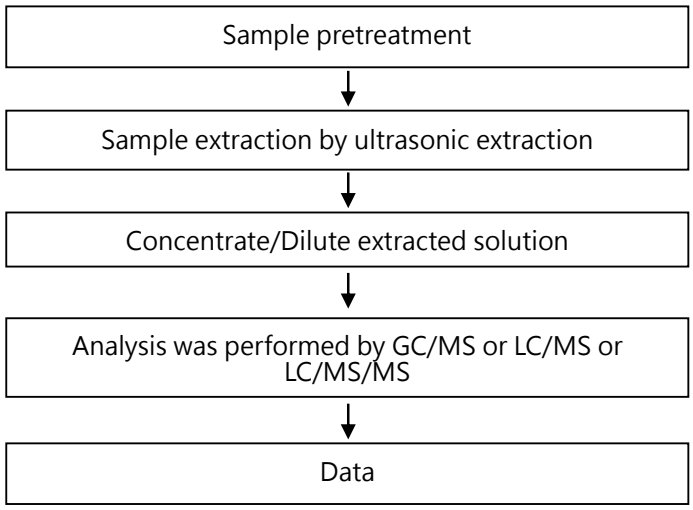
Analytical flow chart - PAHs (Polycyclic Aromatic Hydrocarbons)



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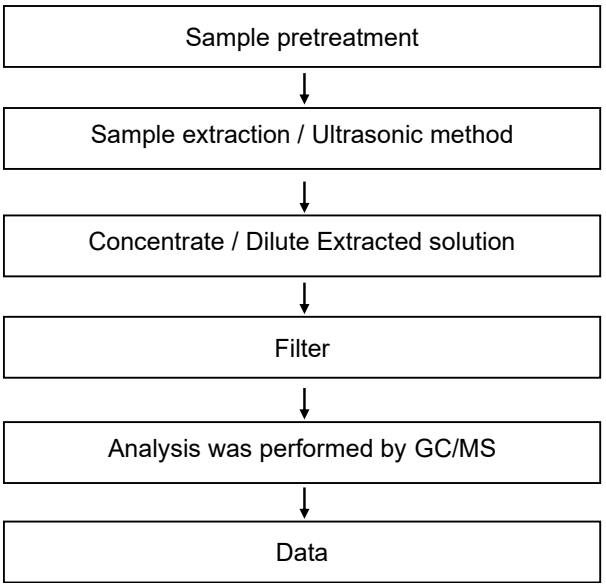
Analytical flow chart – PFAS (including PFOA/PFOS/its related compound, etc.)



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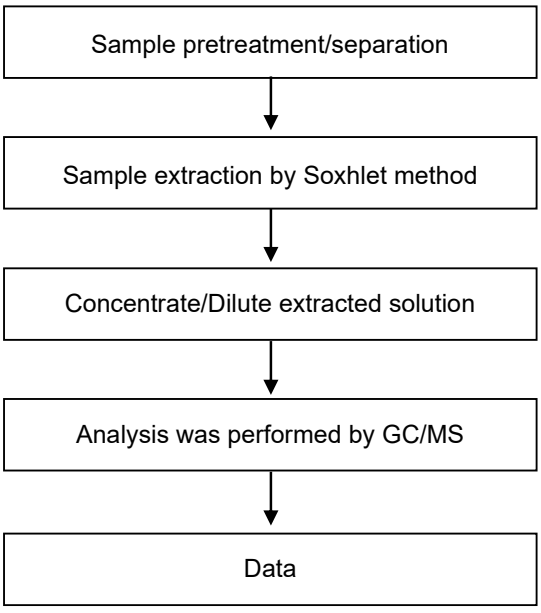
Analytical flow chart - Ethylene glycol ether



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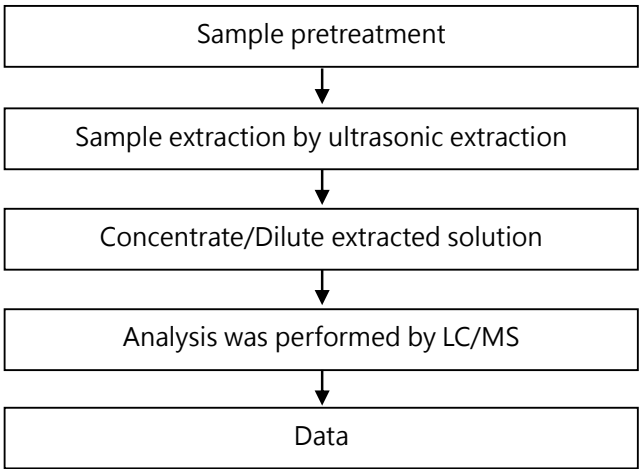
Analytical flow chart - Phthalate



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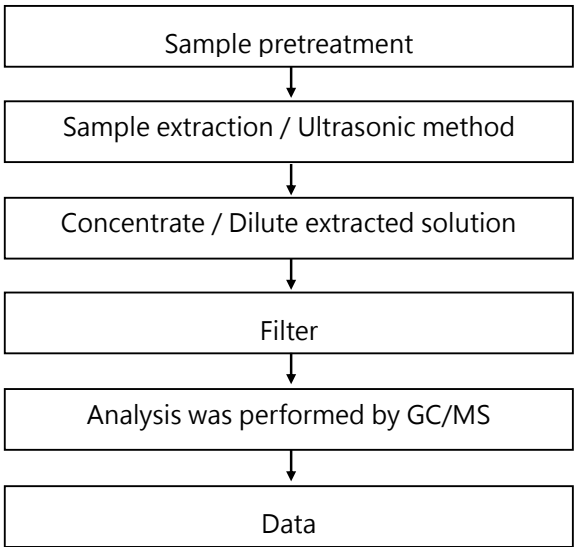
Analytical flow chart - NP、OP、4-t-OP、NPEO、OPEO



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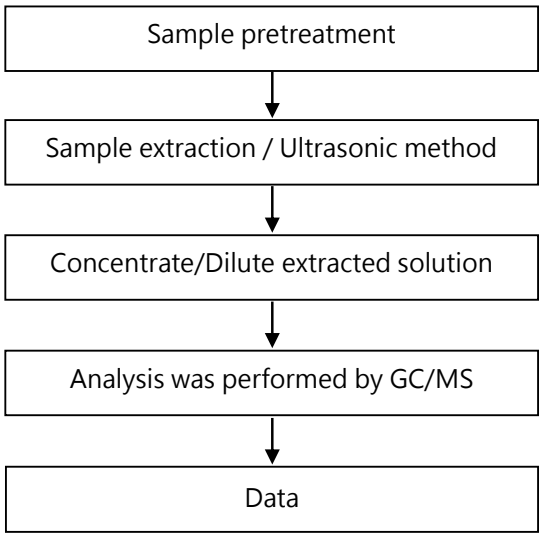
Analytical flow chart - Organic phosphorus compounds



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Analytical flow chart of N,N-Dimethylacetamide



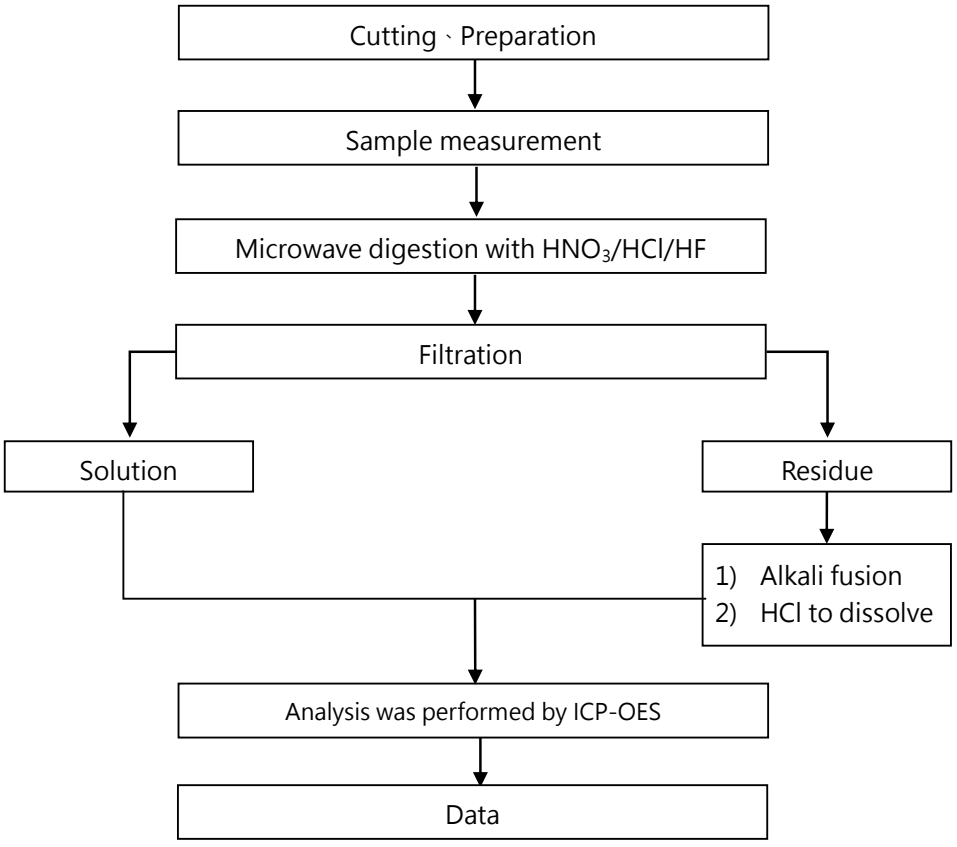
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Analytical flow chart of elements (Heavy metal included)

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

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

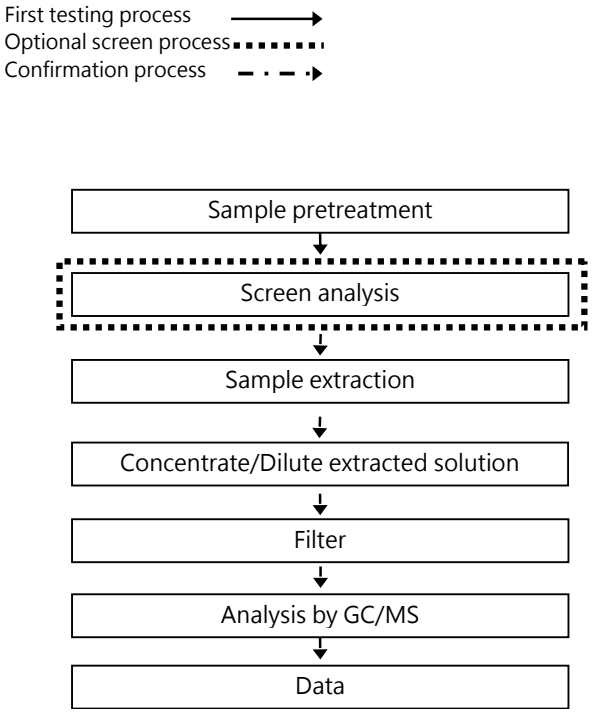


* US EPA 3051A method does not add HF.

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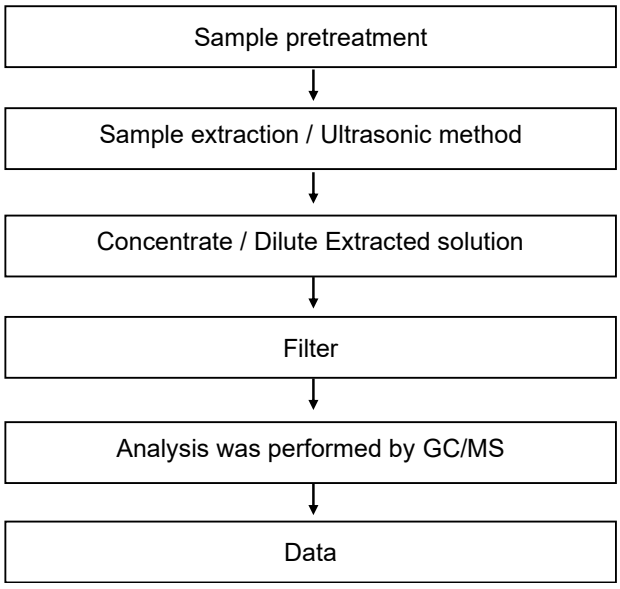
Analytical flow chart - TBBP-A-bis



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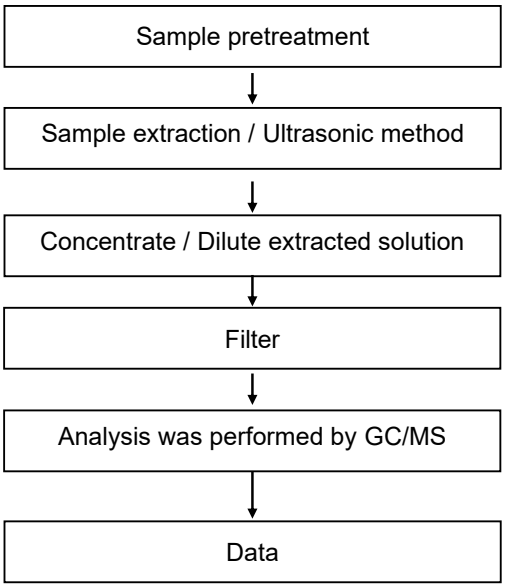
Analytical flow chart - BNST



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Analytical flow chart - Dimethyl Fumarate

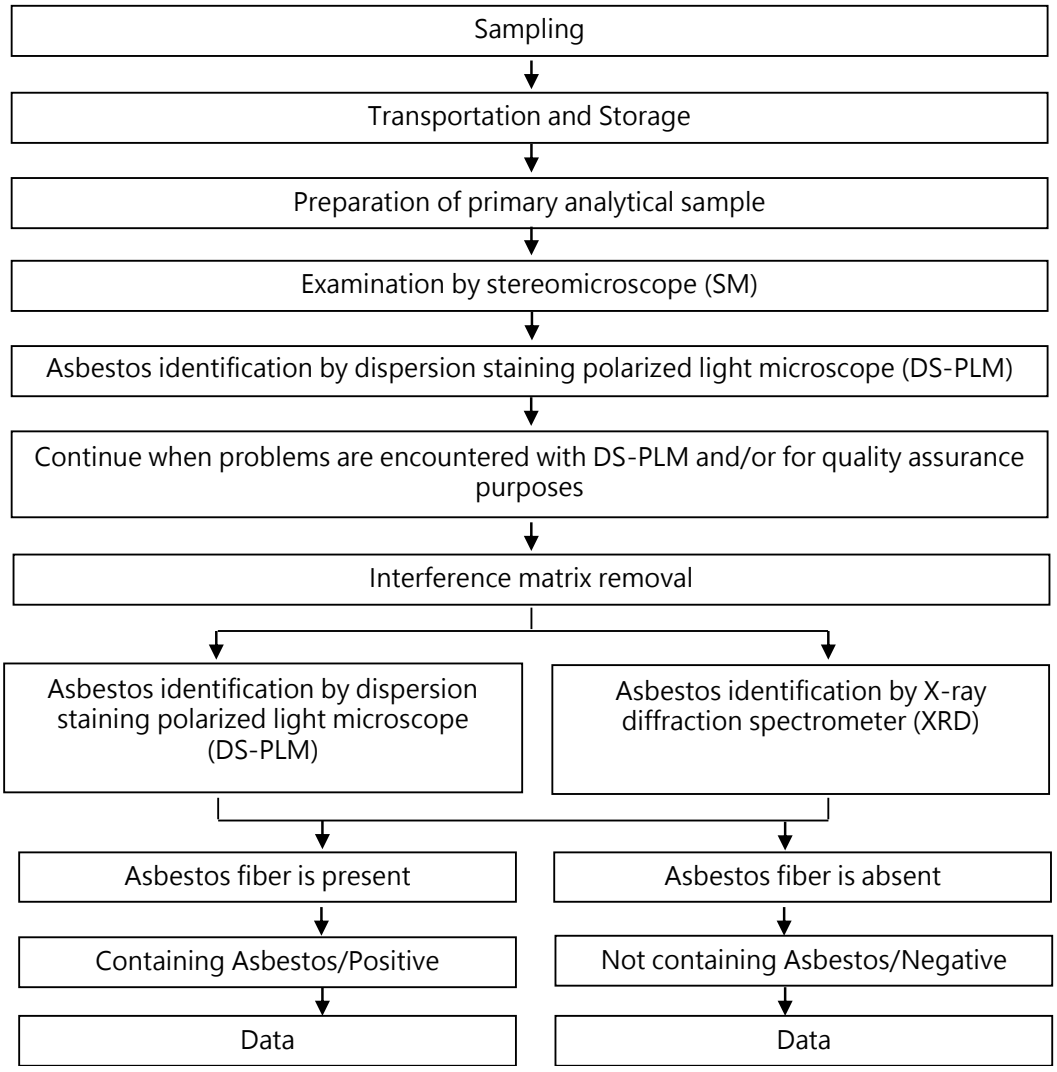


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Analysis flow chart for determination of Asbestos

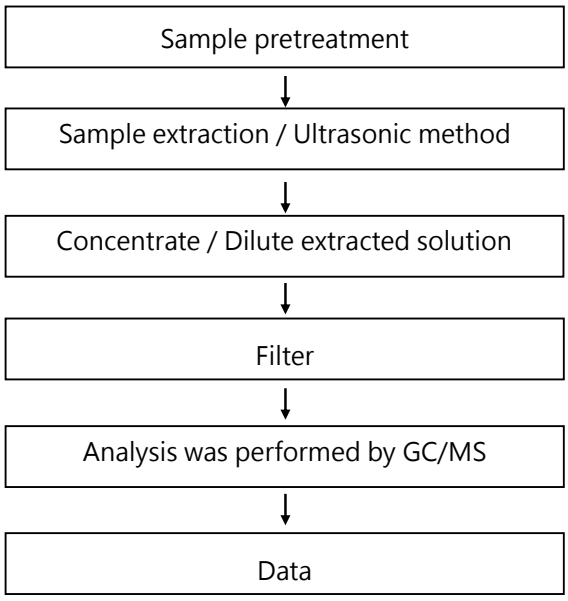
【Reference method: EPA 600/R-93/116】



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

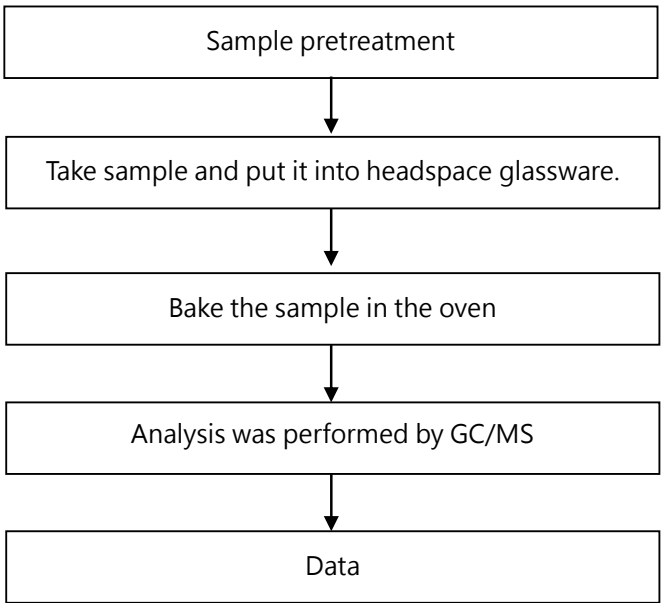


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Analytical flow chart of volatile organic compounds (VOCs)

【Reference method：US EPA 5021A】

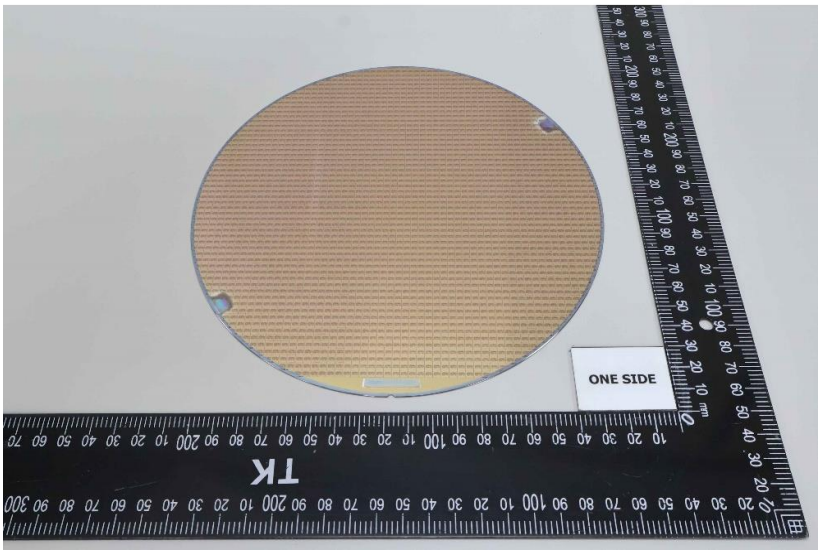


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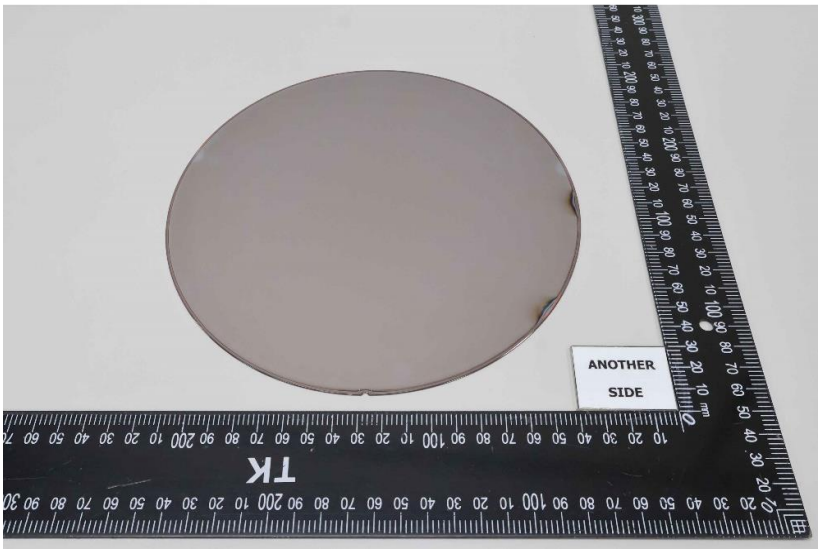
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*** The tested sample / part is marked by an arrow if it's shown on the photo. ***

ETR26100002



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Declaration of RoHS & HF

We, ANPEC Electronics Corporation, declare that all products provide to customer do not contain any of the substances (list in table) above the maximum concentration values banned in the RoHS directive 2011/65/EU as well as the amendment 2015/863/EU and Halogen Free directive IEC61249-2-21. Customers can use these parts with no concern. For further question or inquiry regarding the RoHS and HF, customer may contact us through our Sales representative.

No	Substance	Declaration Threshold
1	Cadmium and cadmium compounds (Cd)	100 ppm
2	Lead and lead compounds (Pb)	1000 ppm
3	Mercury and mercury compounds (Hg)	1000 ppm
4	Hexavalent chromium compounds (Cr 6+)	1000 ppm
5	Polybrominated biphenyls (PBBs)	1000 ppm
6	Polybrominated diphenyl ethers (PBDEs)	1000 ppm
7	Dibutyl phthalate (DBP)	1000 ppm
8	Butyl benzyl phthalate (BBP)	1000 ppm
9	Di(2-ethylhexyl) phthalate (DEHP)	1000 ppm
10	Diisobutyl phthalate (DIBP)	1000 ppm
11	Bromine (Br)	900 ppm
12	Chlorine (Cl)	900 ppm
13	Bromine (Br)+ Chlorine (Cl)	1500 ppm

Company Seal :



Company Name：**ANPEC Electronics Corporation**
Address：No.6, Dusing 1st Rd., Hsinchu Science Park, Hsinchu, 300, Taiwan, R.O.C.
TEL：886-3-5642000
FAX：886-3-5642050
Date：2020/07/01

Declaration of REACH SVHCs

We, ANPEC Electronics Corporation, declare that all products provide to customer don't contain or use 253 REACH SVHCs candidates exceeding the defined threshold 0.1% by weight in homogenous material. Customers can use these parts with no concern. For further question or inquiry regarding the REACH SVHCs, customer may contact us through our Sales representative.

Company Seal : 

Company Name：**ANPEC Electronics Corporation**
Address：No.6, Dusing 1st Rd., Hsinchu Science Park, Hsinchu, 300, Taiwan, R.O.C.
TEL：886-3-5642000
FAX：886-3-5642050
Date：2026/2/9

總項次 No.	批次 No.	化學物質名稱Substances		化學文摘號碼 CAS No.	歐洲委員會號碼 EC No.
第一批管制物質(2008.10.09)					
1	1-1	Anthracene	蒽	120-12-7	204-371-1
2	1-2	4,4'- Diaminodiphenylmethane	4,4-二氨基二苯甲烷(MDA)	101-77-9	202-974-4
3	1-3	Dibutyl phthalate	鄰苯二甲酸二丁酯(DBP)	84-74-2	201-557-4
4	1-4	Cobalt dichloride	二氯化鈷	7646-79-9	231-589-4
5	1-5	Diarsenic pentaoxide	五氧化二砷	1303-28-2	215-116-9
6	1-6	Diarsenic trioxide	三氧化二砷,俗稱砒霜	1327-53-3	215-481-4
7	1-7	Sodium dichromate, dihydrate	重鉻酸鈉	7789-12-0 10588-01-9	234-190-3
8	1-8	5-tert-butyl-2,4,6-trinitro-m-xylene (musk xylene)	內二甲苯麝香	81-15-2	201-329-4
9	1-9	Bis (2-ethyl(hexyl)phthalate) (DEHP)	鄰苯二甲酸二(2-乙基己基)酯(DEHP)	117-81-7	204-211-0
10	1-10	Hexabromocyclododecane (HBCDD)	六溴環十二烷及其異構物	25637-99-4 3194-55-6 134237-50-6 134237-51-7 134237-52-8	247-148-4 221-695-9
11	1-11	Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins)	短鏈氯化石蠟(C10-13)	85535-84-8	287-476-5
12	1-12	Bis(tributyltin)oxide	氧化三丁錫(TBTO)	56-35-9	200-268-0
13	1-13	Lead hydrogen arsenate	砷酸鉛	7784-40-9	232-064-2
14	1-14	Triethyl arsenate	三乙砷酸酯	15606-95-8	427-700-2
15	1-15	Benzyl butyl phthalate	鄰苯二甲酸甲苯基丁酯(BBP)	85-68-7	201-622-7
第二批管制物質(2010.01.13)					
16	2-1	Anthracene oil	蒽油	90640-80-5	292-602-7
17	2-2	Anthracene oil, anthracene paste, distn. Lights	蒽油, 蒽糊, 輕油	91995-17-4	295-278-5

總項次 No.	批次 No.	化學物質名稱Substances		化學文摘號碼 CAS No.	歐洲委員會號碼 EC No.
18	2-3	Anthracene oil, anthracene paste, anthracene fraction	蒽油, 蒽糊,蒽餾分	91995-15-2	295-275-9
19	2-4	Anthracene oil, anthracene-low	蒽油, 含蒽量少	90640-82-7	292-604-8
20	2-5	Anthracene oil, anthracene paste	蒽油, 蒽糊	90640-81-6	292-603-2
21	2-6	Pitch, coal tar, high temp	煤瀝青, 高溫	65996-93-2	266-028-2
22	2-7	Acrylamide	丙烯醯	79-06-1	201-173-7
23	2-8	2,4-Dinitrotoluene	2,4-二硝基甲苯	121-14-2	204-450-0
24	2-9	Diisobutyl phthalate	鄰苯二甲酸二異丁酯(DIBP)	84-69-5	201-553-2
25	2-10	Lead chromate	鉻酸鉛	7758-97-6	231-846-0
26	2-11	Lead chromate molybdate sulphate red (C.I. Pigment Red 104)	鉬鉻紅:顏色索引 (顏料紅半104)	12656-85-8	235-759-9
27	2-12	Lead sulfochromate yellow (C.I. Pigment Yellow 34)	鉻酸鉛:顏色索引 (顏料黃34)	1344-37-2	215-693-7
28	2-13	tris(2-chloroethyl)phosphate	三(2-氯乙基)磷酸酯	115-96-8	204-118-5
第三批管制物質(2010.03.08)					
29	3-1	Trichloroethylene	三氯乙烯	79-01-6	201-167-4
30	3-2	Boric acid	硼酸	10043-35-3 11113-50-1	233-139-2 234-343-4
31	3-3	Disodium tetraborate, anhydrous	四硼酸鈉(無水) 無水硼砂	1303-96-4 1330-43-4 12179-04-3	215-540-4
32	3-4	Tetraboron disodium heptaoxide, hydrate	水合硼酸鈉	12267-73-1	235-541-3
33	3-5	Sodium chromate	鉻酸鈉	7775-11-3	231-889-5
34	3-6	Potassium chromate	鉻酸鉀	7789-00-6	232-140-5
35	3-7	Ammonium dichromate	重鉻酸銨	7789-09-5	232-143-1
36	3-8	Potassium dichromate	重鉻酸鉀	7778-50-9	231-906-6
第四批管制物質(2010.12.15)					
37	4-1	Cobalt(II) sulphate	硫酸鈷	10124-43-3	233-334-2
38	4-2	Cobalt(II) dinitrate	硝酸鈷	10141-05-6	233-402-1
39	4-3	Cobalt(II) carbonate	碳酸鈷	513-79-1	208-169-4
40	4-4	Cobalt(II) diacetate	醋酸鈷	71-48-7	200-755-8
41	4-5	2-Methoxyethanol	乙二醇單甲醚	109-86-4	203-713-7
42	4-6	2-Ethoxyethanol	乙二醇單乙醚	110-80-5	203-804-1
43	4-7	Chromium trioxide	三氧化鉻	1333-82-0	215-607-8
44	4-8	Acids generated from chromium trioxide and chromium trioxide and their oligomers: Chromic acid Dichromic acid Oligomers of chromic acid and dichromic acid	鉻酸及其寡聚體產生的酸類： 鉻酸 重鉻酸 鉻酸及重鉻酸的寡聚體	7738-94-5 13530-68-2	231-801-5 236-881-5
第五批管制物質(2011.05.31)					
45	5-1	(2-ethoxyethyl acetate	乙二醇乙醚乙酸酯	111-15-9	203-839-2
46	5-2	strontium chromate	鉻酸鍶	7789-06-2	232-142-6
47	5-3	1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters	鄰苯二甲酸二(C7-11支鏈與直鏈)烷基酯	68515-42-4	271-084-6
48	5-4	Hydrazine	聯氨	7803-57-8 302-01-2	206-114-9
49	5-5	1-methyl-2-pyrrolidone	N-甲基吡咯烷酮	872-50-4	212-828-1
50	5-6	1,2,3-trichloropropane	1,2,3-三氯丙烷	96-18-4	202-486-1
51	5-7	1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich	鄰苯二甲酸二(C6-8支鏈與直鏈)烷基酯，富C7	71888-89-6	276-158-1
第六批管制物質(2011.12.19)					
52	6-1	Dichromium tris(chromate)	鉻酸鉻	24613-89-6	246-356-2
53	6-2	Potassium hydroxyoctaoxodizincatedi-chromate	氫氧化鉻酸鋅鉀	11103-86-9	234-329-8

總項次 No.	批次 No.	化學物質名稱Substances		化學文摘號碼 CAS No.	歐洲委員會號碼 EC No.
54	6-3	Pentazinc chromate octahydroxide	C.I.顏料黃 36	49663-84-5	256-418-0
55	6-4	Aluminosilicate Refractory Ceramic Fibres (RCF) are fibres covered by index number 650-017-00-8 in Annex VI, part 3, table 3.1 of Regulation	矽酸鋁, 耐火陶瓷纖維	-	
56	6-5	Zirconia Aluminosilicate Refractory Ceramic Fibres (Zr-RCF) are fibres covered by index number 650-017-00-8 in Annex VI, part 3, table 3.1 of Regulation	氧化鋯矽酸, 耐火陶瓷纖維	-	
57	6-6	Formaldehyde, oligomeric reaction products with aniline (technical MDA)	甲醛和苯胺聚合物	25214-70-4	500-036-1
58	6-7	Bis(2-methoxyethyl) phthalate	鄰苯二甲酸二甲氧乙酯	117-82-8	204-212-6
59	6-8	2-Methoxyaniline; o-Anisidine	鄰甲氧基苯胺	90-04-0	201-963-1
60	6-9	4-(1,1,3,3-tetramethylbutyl)phenol, (4-tert-Octylphenol)	對特辛基苯酚	140-66-9	205-426-2
61	6-10	1,2-Dichloroethane	1,2-二氯乙烷	107-06-2	203-458-1
62	6-11	Bis(2-methoxyethyl) ether	二甘醇二甲醚	111-96-6	203-924-4
63	6-12	Arsenic acid	砷酸	7778-39-4	231-901-9
64	6-13	Calcium arsenate	砷酸鈣	7778-44-1	231-904-5
65	6-14	Trilead diarsenate	砷酸鉛	3687-31-8	222-979-5
66	6-15	N,N-dimethylacetamide (DMAC)	N,N-二甲基乙醯胺	127-19-5	204-826-4
67	6-16	2,2'-dichloro-4,4'-methylenedianiline (MOCA)	4,4'-二氨基-3,3'-二氯二苯甲烷,	101-14-4	202-918-9
68	6-17	Phenolphthalein	酚酞	77-09-8	201-004-7
69	6-18	Lead azide Lead diazide	疊氮化鉛	13424-46-9	236-542-1
70	6-19	Lead styphnate	收斂酸鉛	15245-44-0	239-290-0
71	6-20	Lead dipicrate	苦味酸鉛	6477-64-1	229-335-2
第七批管制物質(2012.06.18)					
72	7-1	1,2-bis(2-methoxyethoxy)ethane (TEGDME; triglyme)	三甘醇二甲醚	112-49-2	203-977-3
73	7-2	1,2-dimethoxyethane; ethylene glycol dimethyl ether (EGDME)	乙二醇二甲醚	110-71-4	203-794-9
74	7-3	Diboron trioxide	三氧化二硼	1303-86-2	215-125-8
75	7-4	Formamide	甲醯胺	75-12-7	200-842-0
76	7-5	Lead(II) bis(methanesulfonate)	甲基磺酸鉛	17570-76-2	401-750-5
77	7-6	TGIC (1,3,5-tris(oxiranylmethyl)-1,3,5-triazine-2,4,6(1H,3H,5H)-trione)	異氰尿酸三縮水甘油酯	2451-62-9	219-514-3
78	7-7	β-TGIC (1,3,5-tris[(2S and 2R)-2,3-epoxypropyl]-1,3,5-triazine-2,4,6-(1H,3H,5H)-trione)	異氰尿酸β-三縮水甘油酯	59653-74-6	423-400-0
79	7-8	4,4'-bis(dimethylamino)benzophenone (Michler's ketone)	4,4'-二(N,N-二甲氨基)二苯甲酮（米氏酮）	90-94-8	202-027-5
80	7-9	N,N,N',N'-tetramethyl-4,4'-methylenedianiline (Michler's base)	4,4'-(对二甲氨基)二苯基甲烷（米氏鹼）	101-61-1	202-959-2
81	7-10	[4-[4,4'-bis(dimethylamino) benzhydrylidene]cyclohexa-2,5-dien-1-ylidene]dimethylammonium chloride (C.I. Basic Violet 3)	鹼性紫 3	548-62-9	208-953-6
82	7-11	[4-[[4-anilino-1-naphthyl][4-(dimethylamino)phenyl]methylene]cyclohexa-2,5-dien-1-ylidene] dimethylammonium chloride (C.I. Basic Blue 26)	鹼性藍 26	2580-56-5	219-943-6
83	7-12	α,α-Bis[4-(dimethylamino)phenyl]-4 (phenylamino)naphthalene-1-methanol (C.I. Solvent Blue 4)	溶劑藍 4	6786-83-0	229-851-8
84	7-13	4,4'-bis(dimethylamino)-4''-(methylamino)trityl alcohol	α, α-二[(二甲氨基)苯基]-4-甲氨基苯甲醇	561-41-1	209-218-2
第八批管制物質(正式公布 2012.12.19)					

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85	8-1	Pyrochlore, antimony lead yellow	顏料黃41 C.I. Pigment Yellow 41	8012-00-8	232-382-1
86	8-2	6-methoxy-m-toluidine (p-cresidine) (2-Methoxy-5-methylaniline)	2-甲氧基-5-甲基苯胺	120-71-8	204-419-1
87	8-3	Hexahydromethylphthalic anhydride , Hexahydro-4-methylphthalic anhydride , Hexahydro-1-methylphthalic anhydride , Hexahydro-3-methylphthalic anhydride	甲基六氫苯酐、4-甲基六氫苯酐、甲基六氫化鄰苯二甲酸酐、3-甲基六氫苯二甲酯酐	25550-51-0 19438-60-9 48122-14-1 57110-29-9	247-094-1 243-072-0 256-356-4 260-566-1
88	8-4	Cyclohexane-1,2-dicarboxylic anhydride (Hexahydrophthalic anhydride - HHPA)	順環己烷-1,2-二羧酸酐 (六氫鄰苯二甲酸酐)	85-42-7 13149-00-3 14166-21-3	201-604-9 236-086-3 238-009-9
89	8-5	Dibutyltin dichloride (DBTC)	二丁基二氯化錫	683-18-1	211-670-0
90	8-6	Lead bis(tetrafluoroborate)	氟硼酸鉛	13814-96-5	237-486-0
91	8-7	Lead dinitrate	硝酸鉛	10099-74-8	233-245-9
92	8-8	Silicic acid, lead salt	矽酸鉛	11120-22-2	234-363-3
93	8-9	4-Aminoazobenzene	4-胺基偶氮苯	60-09-3	200-453-6
94	8-10	Lead titanium zirconium oxide	鈦酸鉛鋯	12626-81-2	235-727-4
95	8-11	Lead monoxide (lead oxide)	氧化鉛	1317-36-8	215-267-0
96	8-12	o-Toluidine	鄰甲基苯胺	95-53-4	202-429-0
97	8-13	3-ethyl-2-methyl-2-(3-methylbutyl)-1,3-oxazolidine	3-乙基-2-甲基-2-(3-甲基丁基)噁唑烷	143860-04-2	421-150-7
98	8-14	Silicic acid (H2Si2O5), barium salt (1:1), lead-doped [with lead (Pb) content above the applicable generic concentration limit for 'toxicity for reproduction' Repr. 1A (CLP) or category 1 (DSD); the substance is a member of the group entry of lead compounds, with index number 082-001-00-6 in Regulation (EC) No 1272/2008]	摻雜鉛的矽酸鋇	68784-75-8	272-271-5
99	8-15	Trilead bis(carbonate)dihydroxide	鹼式碳酸鉛	1319-46-6	215-290-6
100	8-16	Furan	呋喃	110-00-9	203-727-3
101	8-17	N,N-dimethylformamide	N,N-二甲基甲醯胺	68-12-2	200-679-5
102	8-18	4-(1,1,3,3-tetramethylbutyl)phenol, ethoxylated [covering well-defined substances and UVCB substances, polymers and homologues]	辛基酚聚醚-9，包括界定明確的物質以及UVCB物質、聚合物和同系物	-	-
103	8-19	4-Nonylphenol, branched and linear [substances with a linear and/or branched alkyl chain with a carbon number of 9 covalently bound in position 4 to phenol, covering also UVCB- and well-defined substances which include any of the individual isomers or a combination thereof]	支鏈及直鏈壬基酚-包括含有9個碳烷基鏈之所有獨立同分異構體及所有含有含直鏈或支鏈之9個碳烷基鏈UVCB物質	-	-
104	8-20	4,4'-methylenedi-o-toluidine	4,4'-二氨基-3,3'-二甲基二苯甲烷	838-88-0	212-658-8
105	8-21	Diethyl sulphate	硫酸二乙酯	64-67-5	200-589-6
106	8-22	Dimethyl sulphate	硫酸二甲酯	77-78-1	201-058-1
107	8-23	Lead oxide sulfate	鹼式硫酸鉛	12036-76-9	234-853-7
108	8-24	Lead titanium trioxide	鈦酸鉛	12060-00-3	235-038-9
109	8-25	Acetic acid, lead salt, basic	鹼式乙酸鉛	51404-69-4	257-175-3
110	8-26	[Phthalato(2-)]dioxotrilead	二鹽基鄰苯二甲酸鉛	69011-06-9	273-688-5
111	8-27	Bis(pentabromophenyl) ether (decabromodiphenyl ether; DecaBDE)	十溴聯苯醚	1163-19-5	214-604-9
112	8-28	N-methylacetamide	N-甲基乙醯胺	79-16-3	201-182-6
113	8-29	Dinoseb (6-sec-butyl-2,4-dinitrophenol)	地樂酚	88-85-7	201-861-7
114	8-30	1,2-Diethoxyethane	乙二醇二乙醚	629-14-1	211-076-1
115	8-31	Tetralead trioxide sulphate	三鹼式硫酸鉛	12202-17-4	235-380-9
116	8-32	N-pentyl-isopentylphthalate	鄰苯二甲酸正戊基異戊基酯	776297-69-9	-

總項次 No.	批次 No.	化學物質名稱Substances		化學文摘號碼 CAS No.	歐洲委員會號碼 EC No.
117	8-33	Dioxobis(stearato)trilead	雙(十八酸基)二氧代三鉛	12578-12-0	235-702-8
118	8-34	Tetraethyllead	四乙基鉛	78-00-2	201-075-4
119	8-35	Pentalead tetraoxide sulphate	氧化鉛與硫酸鉛的複合物	12065-90-6	235-067-7
120	8-36	Pentacosafluorotridecanoic acid	全氟十三酸	72629-94-8	276-745-2
121	8-37	Tricosafluorododecanoic acid	全氟十二烷酸	307-55-1	206-203-2
122	8-38	Henicosafluoroundecanoic acid	全氟十一烷酸	2058-94-8	218-165-4
123	8-39	Heptacosafluorotetradecanoic acid	全氟代十四酸	376-06-7	206-803-4
124	8-40	1-bromopropane (n-propyl bromide)	1-溴丙烷(正溴丙烷)	106-94-5	203-445-0
125	8-41	Methoxyacetic acid	甲氧基乙酸	625-45-6	210-894-6
126	8-42	4-methyl-m-phenylenediamine (toluene-2,4-diamine)	2,4-二氨基甲苯	95-80-7	202-453-1
127	8-43	Methyloxirane (Propylene oxide)	環氧丙烷(1,2-環氧丙烷)	75-56-9	200-879-2
128	8-44	Trilead dioxide phosphonate	磷酸氧化鉛	12141-20-7	235-252-2
129	8-45	o-aminoazotoluene	鄰氨基偶氮甲苯	97-56-3	202-591-2
130	8-46	1,2-Benzenedicarboxylic acid, dipentylester, branched and linear	1，2-苯二羧二戊酯（支鏈和直鏈）	84777-06-0	284-032-2
131	8-47	4,4'-oxydianiline and its salts	4,4'-二氨基二苯醚	101-80-4	202-977-0
132	8-48	Orange lead (lead tetroxide)	四氧化三鉛	1314-41-6	215-235-6
133	8-49	Biphenyl-4-ylamine	4-氨基聯苯	92-67-1	202-177-1
134	8-50	Diisopentylphthalate(DIPP)	鄰苯二甲酸二異戊酯	605-50-5	210-088-4
135	8-51	Fatty acids, C16-18, lead salts	C16-18-脂肪酸鉛鹽	91031-62-8	292-966-7
136	8-52	Diazene-1,2-dicarboxamide (C,C'-azodi(formamide))	偶氮二甲醯胺	123-77-3	204-650-8
137	8-53	Sulfurous acid, lead salt, dibasic	亞硫酸鉛（II）	62229-08-7	263-467-1
138	8-54	Lead cyanamidate	氨基氰鉛鹽	20837-86-9	244-073-9
第九批管制物質(2013.06.20)					
139	9-1	Cadmium	鎘	7440-43-9	231-152-8
140	9-2	Cadmium oxide	氧化鎘	1306-19-0	215-146-2
141	9-3	Ammonium pentadecafluorooctanoate (APFO)	全氟辛酸銨	3825-26-1	223-320-4
142	9-4	Pentadecafluorooctanoic acid (PFOA)	全氟辛酸	335-67-1	206-397-9
143	9-5	Dipentyl phthalate (DPP)	鄰苯二甲酸二戊酯	131-18-0	205-017-9
144	9-6	4-Nonylphenol, branched and linear, ethoxylated [substances with a linear and/or branched alkyl chain with a carbon number of 9 covalently bound in position 4 to phenol, ethoxylated covering UVCB- and well-defined substances, polymers and homologues, which include any of the individual isomers and/or combinations thereof]	分支或線性的乙氧化壬基酚，包括含有9個碳烷基鏈的所有獨立的同分異構體和所有含有線性或分支9個碳烷基鏈的UVCB物質	-	-
第十批管制物質(2013.12.16)					
145	10-1	Cadmium sulphide	硫化鎘	1306-23-6	215-147-8
146	10-2	Dihexyl phthalate	鄰苯二甲酸二己酯	84-75-3	201-559-5
147	10-3	Disodium 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(azo)]bis(4-aminonaphthalene-1-sulphonate) (C.I. Direct Red 28)	直接紅28	573-58-0	209-358-4
148	10-4	Disodium 4-amino-3-[[4'-[(2,4-diaminophenyl)azo][1,1'-biphenyl]-4-yl]azo] -5-hydroxy-6-(phenylazo)naphthalene-2,7-disulphonate (C.I. Direct Black 38)	直接黑38	1937-37-7	217-710-3
149	10-5	Imidazolidine-2-thione; 2-imidazoline-2-thiol	亞乙基硫脲	96-45-7	202-506-9
150	10-6	Lead di (acetate)	醋酸鉛	301-04-2	206-104-4

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151	10-7	Trixylyl phosphate	磷酸三（二甲苯）酯	25155-23-1	246-677-8
第十一批管制物質(2014.06.16)					
152	11-1	1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linear	鄰苯二甲酸二己酯(支鏈和直鏈)	271-093-5	68515-50-4
153	11-2	Cadmium chloride	氯化鎘	233-296-7	10108-64-2
154	11-3	Sodium perborate; perboric acid, sodium salt	過硼酸鈉	239-172-9 234-390-0	-
155	11-4	Sodium peroxometaborate	過氧偏硼酸鈉	231-556-4	7632-04-4
第十二批管制物質(2014.12.17)					
156	12-1	Cadmium fluoride	氟化鎘	7790-79-6	232-222-0
157	12-2	Cadmium sulphate	硫酸鎘	10124-36-4 31119-53-6	233-331-6
158	12-3	2-benzotriazol-2-yl-4,6-di-tert-butylphenol (UV-320)	2-苯并三唑-2-基-4,6-二-三級-丁基苯酚 (UV-320)	3846-71-7	223-346-6
159	12-4	2-(2H-benzotriazol-2-yl)-4,6-ditertpentylphenol (UV-328)	2-(2H-苯并三唑-2-基)-4,6-二三級戊基苯酚 (UV-328)	25973-55-1	247-384-8
160	12-5	2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (DOTE)	10-乙基-4,4-二辛基-7-側氧-8-氧代-3,5-二硫代-4-錫代十四酸2-乙基己酯(DOTE)	15571-58-1	239-622-4
161	12-6	reaction mass of 2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate and 2-ethylhexyl 10-ethyl-4-[[2-[(2-ethylhexyl)oxy]-2-oxo ethyl]thio]-4-octyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (reaction mass of DOTE and MOTE)	10-乙基-4,4-二辛基-7-氧-8-氧代-3,5-二硫代-4-錫代十四酸2-乙基己酯和10-乙基-4-[[2-[(2-乙基己基)氧]-2-氧乙基]硫代]-4-辛基-7-氧-8-氧代-3,5-二硫代-4-錫代十四酸2-乙基己酯的反應產物 (DOTE 和 MOTE 的反應產物)	-	-
第十三批管制物質(2015.06.15)					
162	13-1	1,2-benzenedicarboxylic acid, di-C6-10-alkyl esters; 1,2-benzenedicarboxylic acid, mixed decyl and hexyl and octyl diesters with ≥ 0.3% of dihexyl phthalate	鄰苯二甲酸二（C6-C6）烷基酯：(癸基，己基，辛基)酯與1,2-鄰苯二甲酸的複合物且鄰苯二甲酸二己酯含量 ≥ 0.3%	68515-51-5 68648-93-1	271-094-0 272-013-1
163	13-2	5-sec-butyl-2-(2,4-dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane [1], 5-sec-butyl-2-(4,6-dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane [2] [covering any of the individual isomers of [1] and [2] or any combination thereof]	[1]為卡拉花醛，[2]為卡拉花醛的一種同分異構化合物	-	-
第十四批管制物質(2015.12.17)					
164	14-1	Nitrobenzene	硝基苯	98-95-3	202-716-0
165	14-2	2,4-Di-*tert*-butyl-6-(5-chlorobenzotriazol-2-yl)phenol (UV-327)	2,4-二-叔丁基-6-(5-氯代苯并三唑-2-基)苯酚	3864-99-1	223-383-8
166	14-3	2-(2H-Benzotriazol-2-yl)-4-(*tert*-butyl)-6-(sec-butyl)phenol (UV-350)	2-(2H-苯並三唑-2-基)-4-(叔丁基)-6-(仲丁基)苯酚	36437-37-3	253-037-1
167	14-4	1,3-Propanesultone	1,3-丙烷磺內酯	1120-71-4	214-317-9
168	14-5	Perfluorononan-1-oic-acid and its sodium and ammonium salts	全氟壬酸及其鈉鹽和銨鹽	375-95-1 21049-39-8 4149-60-4	206-801-3
第十五批管制物質(2016.06.20)					
169	15-1	Benzoyl【def】chrysene(Benzo[a]pyrene)	苯并(a)芘 (BaP)	50-32-8	200-028-5
第十六批管制物質(2017.01.12)					
170	16-1	4,4'-isopropylidenediphenol (bisphenol A)	雙酚A	80-05-7	201-245-8
171	16-2	4-Heptylphenol, branched and linear [substances with a linear and/or branched alkyl chain with a carbon number of 7 covalently bound predominantly in position 4 to phenol, covering also UVCB- and well-defined substances which include any of the individual isomers or a combination thereof]	4-庚基苯酚, 支鍊及直鍊 包括含有7個碳烷基鏈的所有獨立的同分異構體和所有含有線性或分支7個碳烷基鏈的UVCB物質	-	-

總項次 No.	批次 No.	化學物質名稱Substances		化學文摘號碼 CAS No.	歐洲委員會號碼 EC No.
172	16-3	Nonadecafluorodecanoic acid (PFDA) and its sodium and ammonium salts	十九氟癸酸及其鈉和銨鹽	3108-42-7 335-76-2 3830-45-3	206-400-3 221-470-5
173	16-4	p-(1,1-dimethylpropyl)phenol	對(1,1-二甲基丙基)苯酚	80-46-6	201-280-9
第十七批管制物質(2017.07.07)					
174	17-1	Perfluorohexane-1-sulphonic acid and its salts (PFHxS)	全氟己基磺酸及其鹽類	355-46-4	206-587-1
第十八批管制物質(2018.01.15)					
175	18-1	Chrysene	䓛	218-01-9	205-923-4
176	18-2	Benz[a]anthracene	苯并[a]蒽	56-55-3	200-280-6
177	18-3	Cadmium nitrate	硝酸鎘	10325-94-7	233-710-6
178	18-4	Cadmium hydroxide	氫氧化鎘	21041-95-2	244-168-5
179	18-5	Cadmium carbonate	碳酸鎘	513-78-0	208-168-9
180	18-6	Dechlorane plus (including any of its individual anti- and syn-isomers or any combination thereof)	十氯三環十八碳二烯 (包含任何順式與反式同分異構物或其他組成)	13560-89-9 135821-74-8 135821-03-3	-
181	18-7	Reaction products of 1,3,4-thiadiazolidine- 2,5-dithione, formaldehyde and 4-heptylphenol, branched and linear (RP-HP) [with ≥ 0.1% w/w 4-heptylphenol, branched and linear]	1,3,4-噻二唑-2,5-二巯酮、甲醛與支鏈和直鏈4-庚基苯酚的反應產物 (含有支鏈和直鏈4-庚基苯酚重量比大於或等於0.1%)	-	-
第十九批管制物質(2018.06.27)					
182	19-1	Octamethylcyclotetrasiloxane (D4)	八甲基環四矽氧烷（D4）	556-67-2	209-136-7
183	19-2	Decamethylcyclopentasiloxane (D5)	十甲基環五矽氧烷（D5）	541-02-6	208-764-9
184	19-3	Dodecamethylcyclohexasiloxane (D6)	十二甲基環六矽氧烷（D6）	540-97-6	208-762-8
185	19-4	Lead	鉛	7439-92-1	231-100-4
186	19-5	Disodium octaborate	八硼酸二鈉	12008-41-2	234-541-0
187	19-6	Benzo[ghi]perylene	苯並[GHI]苝	191-24-2	205-883-8
188	19-7	Terphenyl hydrogenated	三聯苯氫化	61788-32-7	262-967-7
189	19-8	Ethylenediamine (EDA)	乙二胺（EDA）	107-15-3	203-468-6
190	19-9	Benzene-1,2,4-tricarboxylic acid 1,2 anhydride (Trimellitic Anhydride) (TMA)	偏苯三酸酐	552-30-7	209-008-0
191	19-10	Dicyclohexyl Phthalate (DCHP)	鄰苯二甲酸二環己酯	84-61-7	201-545-9
第二十批管制物質(2019.01.15)					
192	20-1	1,7,7-trimethyl-3-(phenylmethylene)bicyclo[2.2.1]heptan-2-one 3-benzylidene camphor; 3-BC	1,7,7-三甲基-3-(苯亞甲基)雙環[2,2,1]庚烷-2-酮 (3-苯亞甲基樟腦)	15087-24-8	239-139-9
193	20-2	2,2-bis(4'-hydroxyphenyl)-4-methylpentane	4 2,2-雙(4-羥基苯基)-4-甲基戊烷	6807-17-6	401-720-1
194	20-3	Benzo[k]fluoranthene	苯駢(k)螢蒽	207-08-9	205-916-6
195	20-4	Fluoranthene	苯駢芘	206-44-0 93951-69-0	205-912-4
196	20-5	Phenanthrene	菲	85-01-8	201-581-5
197	20-6	Pyrene	芘	129-00-0 1718-52-1	204-927-3
第二十一批管制物質(2019.07.16)					
198	21-1	2-methoxyethyl acetate	2-甲氧基乙酸乙酯	110-49-6	203-772-9
199	21-2	Tris(4-nonylphenyl, branched and linear) phosphite (TNPP) with ≥ 0.1% w/w of 4-nonylphenol, branched and linear (4-NP)	三(4-壬基苯基，支鏈和直鏈)亞磷酸酯(TNPP) (4-壬基酚 4-NP，支鏈和直鏈濃度 ≥ 0.1% 重量比)	-	-
200	21-3	2,3,3,3-tetrafluoro-2-(heptafluoropropoxy)propionic acid, its salts and its acyl halides (covering any of their individual isomers and combinations thereof) (denoted as HFPO-DA)	2,3,3,3-四氟-2- (七氟丙氧基)丙酸，及其鹽類與鹵化醯類 (含各自的異構物及其組合) (HFPO-DA)	-	-
201	21-4	4-tert-butylphenol (PTBP)	對-第三丁基苯酚(PTBP)	98-54-4	202-679-0
第二十二批管制物質(2020.01.16)					
202	22-1	Diisohexyl phthalate	鄰苯二甲酸二異己酯	71850-09-4	276-090-2
203	22-2	2-benzyl-2-dimethylamino-4'-morpholino butyrophenone	2-苄基-2-二甲基氨基-4'-嗎啉代丁苯酮	119313-12-1	404-360-3
204	22-3	2-methyl-1-(4-methylthiophenyl)-2-morp holinopropan-1-one	2-甲基-1-（4-甲基硫代苯基）-2-嗎啉代丙烷-1-酮	71868-10-5	400-600-6
205	22-4	Perfluorobutane sulfonic acid (PFBS) and its salts	全氟丁烷磺酸（PFBS）及其鹽	-	-
第二十三批管制物質(2020.06.25)					
206	23-1	Dibutylbis(pentane-2,4-dionato-O,O')tin	二丁基雙(2,4-戊二酮基)錫	22673-19-4	245-152-0
207	23-2	butyl 4-hydroxybenzoate	4-羥基苯甲酸丁酯	94-26-8	202-318-7
208	23-3	2-methylimidazole	2-甲基咪唑	693-98-1	211-765-7
209	23-4	1-vinylimidazole	1-乙烯基咪唑	1072-63-5	214-012-0
第二十四批管制物質(2021.01.19)					
210	24-1	bis(2-(2-methoxyethoxy)ethyl) ether	四乙二醇二甲醚	143-24-8	205-594-7

總項次 No.	批次 No.	化學物質名稱Substances		化學文摘號碼 CAS No.	歐洲委員會號碼 EC No.
211	24-2	Dioctyltin dilaurate, stannane, dioctyl-, bis(coco acyloxy) derivs.,and any other stannane, dioctyl-, bis(fatty acyloxy) derivs.wherein C12 is the predominant carbon number of the fatty acyloxy moiety	二月桂酸二辛基錫，錫烷，二辛基-，雙(椰油醯氧基)衍生物，以及任何其他錫烷，二辛基-，雙脂肪醯氧基)衍生物。其中C12為脂肪醯氧基部分的主要碳原子數	-	-
第二十五批管制物質(2021.07.08)					
212	25-1	2-(4-tert-butylbenzyl) propionaldehyde and its individual stereoisomers	2-(4-叔丁基苄基)丙醛及其各自立體異構物	-	-
213	25-2	Orthoboric acid, sodium salt	硼酸鈉鹽	13840-56-7	237-560-2
214	25-3	2,2-bis(bromomethyl)propane1,3-diol (BMP) 2,2-dimethylpropan-1-ol, tribromo derivative / 3-bromo-2,2-bis(bromomethyl)-1-propanol (TBNPA) 2,3-dibromo-1-propanol (2,3-DBPA)	2,2-雙(溴甲基)-1,3-丙二醇 3-溴-2,2-雙(溴甲基)-1-丙醇 2,3-二溴-1-丙醇	3296-90-0 36483-57-5/1522-92-5 96-13-9	221-967-7 253-057-0 202-480-9
215	25-4	Glutaral	戊二醛	111-30-8	203-856-5
216	25-5	Medium-chain chlorinated paraffins (MCCP) [UVCB substances consisting of more than or equal to 80% linear chloroalkanes with carbon chain lengths within the range from C14 to C17]	中鏈氯化石蠟[UVCB物質，含量大於或等於80%碳鏈長度在C14至C17範圍內的直鏈氯代烷烴]	-	-
217	25-6	Phenol, alkylation products (mainly in para position) with C12-rich branched or linear alkyl chains from oligomerisation, covering any individual isomers and/or combinations thereof (PDDP)	透過由寡聚物反應烷基化的酚產物(主要在對位位置)具有12個碳支鏈或直鏈，並涵蓋其他同分異構物與/或其它組合	-	-
218	25-7	1,4-dioxane	1,4-二氧六環	123-91-1	204-661-8
219	25-8	4,4'-(1-methylpropylidene) bisphenol; (bisphenol B)	雙酚B	77-40-7	201-025-1
第二十六批管制物質(2022.01.17)					
220	26-1	(±)-1,7,7-trimethyl-3-[(4-methylphenyl)methylene]bicyclo[2.2.1]heptan-2-one covering any of the individual isomers and/or combinations thereof (4-MBC	雙酚B(±)-1,7,7-三甲基-3-[(4-甲基苯基)亞甲基]二環[2.2.1]庚烷-2-酮，包括任何獨立異構物及/或其組合 (4-MBC)	-	-
221	26-2	6,6'-di-tert-butyl-2,2'-methylenedi-p-cresol	6,6'雙-三級-丁基-2,2'-亞甲基雙對甲酚	119-47-1	204-327-1
222	26-3	S-(tricyclo(5.2.1.0'2,6)deca-3-en-8(or 9)-yl O-(isopropyl or isobutyl or 2-ethylhexyl) O-(isopropyl or isobutyl or 2-ethylhexyl) phosphorodithioate	硫代磷酸S-(三環[5.2.1.0'2,6]-3-癸烯-8(或9)-基酯O-(異丙酯或異丁酯或2-乙基己酯)O-(異丙酯或異丁酯或2-乙基己酯)	255881-94-8	401-850-9
223	26-4	Tris(2-methoxyethoxy)vinylsilane	三(2-甲氧基乙氧基)乙烯基矽烷	1067-53-4	213-934-0
第二十七批管制物質(2022.06.10)					
224	27-1	N-Methylolacrylamide	N-羥甲基丙烯醯胺	924-42-5	213-103-2
第二十八批管制物質(2023.01.17)					
225	28-1	1,1'-[ethane-1,2-diylbisoxy]bis[2,4,6-tribromobenzene]	1,2-雙(2,4,6-三溴苯氧基)乙烷	37853-59-1	253-692-3
226	28-2	2,2',6,6'-tetrabromo-4,4'-isopropylidenediphenol	四溴雙酚A	79-94-7	201-236-9
227	28-3	4,4'-sulphonyldiphenol	4,4'-磺醯二苯酚（雙酚S）	80-09-1	201-250-5
228	28-4	Barium diboron tetraoxide	偏硼酸鋇	13701-59-2	237-222-4
229	28-5	Bis(2-ethylhexyl) tetrabromophthalate covering any of the individual isomers and/or combinations thereof	雙(2-乙基己基)四溴鄰苯二甲酸酯，覆蓋任何單個異構體和/或其組合	-	-
230	28-6	Isobutyl 4-hydroxybenzoate	4-羥基苯甲酸異丁酯	4247-02-3	224-208-8
231	28-7	Melamine	三聚氰胺	108-78-1	203-615-4
232	28-8	Perfluoroheptanoic acid and its salts	全氟庚酸及其鹽	-	-
233	28-9	reaction mass of 2,2,3,3,5,5,6,6-octafluoro-4-(1,1,1,2,3,3,3-heptafluoropropan-2-yl)morpholine and 2,2,3,3,5,5,6,6-octafluoro-4-(heptafluoropropyl)morpholine	2,2,3,3,5,5,6,6-八氟-4-（1,1,1,2,3,3,3-七氟丙烷-2-基）嗎啉和2,2,3,3,5,5,6,6-八氟-4-（七氟丙基）嗎啉的反應物	-	473-390-7
第二十九批管制物質(2023.06.14)					
234	29-1	Diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide	二苯基(2,4,6-三甲基苯甲醯基)氧化膦	75980-60-8	278-355-8
235	29-2	Bis(4-chlorophenyl) sulphone	二氯二苯碸	80-07-9	201-247-9
第三十批管制物質(2024.01.23)					
236	30-1	2,4,6-Tri-tert-butylphenol	2,4,6-三叔丁基苯酚	732-26-3	211-989-5
237	30-2	2-(2H-benzotriazol-2-yl)-4-(1,1,3,3-tetramethylbutyl) phenol (UV-329)	2-[2-羥基-5-(1,1,3,3-四甲丁基)苯基]苯並三唑	3147-75-9	221-573-5
238	30-3	2-(dimethylamino)-2-[(4-methylphenyl)methyl]-1-[4-(morpholin-4-yl)phenyl] butan-1-one	2-(二甲基氨基)-2-[(4-甲苯基)甲基]-1-[4-(4-嗎啉代)苯基]-1-丁酮	119344-86-4	438-340-0
239	30-4	Bumetrizole (UV-326);2-tert-butyl-6-(5-chloro-2H-benzotriazol-2-yl)-4- methylphenol	2-叔丁基-6-(5-氯-2H-苯並三唑-2-基)-4-甲基苯酚	3896-11-5	223-445-4
240	30-5	Oligomerisation and alkylation reaction products of 2-phenylpropene and phenol	2-苯基丙烯與苯酚的低聚和烷基化反應產物		700-960-7
第三十一批管制物質(2024.06.27)					
241	31-1	Bis(α,α-dimethylbenzyl) peroxide	雙(α,α-二甲基苄基)的過氧化物	80-43-3	201-279-3

總項次 No.	批次 No.	化學物質名稱Substances		化學文摘號碼 CAS No.	歐洲委員會號碼 EC No.
第三十二批管制物質(2024.11.07)					
242	32-1	Triphenyl phosphate	磷酸三苯酯	115-86-6	204-112-2
第三十三批管制物質(2025.01.21)					
243	33-1	6-[(C10-C13)-alkyl-(branched, unsaturated)-2,5-dioxopyrrolidin-1-yl]hexanoic acid	6-[(C10-C13)-烷基-(支鏈，不飽和)-2,5-二氧代吡咯烷-1-基]己酸	2156592-54-8	701-118-1
244	33-2	O,O,O-triphenyl phosphorothioate	O,O,O-三苯基硫代磷酸酯	597-82-0	209-909-9
245	33-3	Octamethyltrisiloxane	八甲基三矽氧烷	107-51-7	203-497-4
246	33-4	Perfluamine	全氟胺	338-83-0	206-420-2
247	33-5	Reaction mass of: triphenylthiophosphate and tertiary butylated phenyl derivatives	反應物料：三苯基硫代磷酸酯和叔丁基化苯基衍生物	192268-65-8	421-820-9
第三十四批管制物質(2025.06.25)					
248	34-1	1,1,1,3,5,5,5-heptamethyl-3-[(trimethylsilyl)oxy]trisiloxane	1,1,1,3,5,5,5-七甲基-3-[(三甲基甲硅烷基)氧基]三硅氧烷	241-867-7	17928-28-8
249	‘34-2	Decamethyltetrasiloxane	十甲基四硅氧烷	205-491-7	141-62-8
250	34-3	Tetra(sodium/potassium) 7-[(E)-{2-acetamido-4-[(E)-(4-{[4-chloro-6-({2-[(4-fluoro-6-{[4-(vinylsulfonyl)phenyl]amino}-1,3,5-triazine-2-yl)amino]propyl}amino)-1,3,5-triazine-2-yl]amino}-5-sulfonato-1-naphthyl)diazenyl]-5-methoxyphenyl}diazenyl]-1,3,6-naphthalenetrisulfonate； Reactive Brown 51	活性棕 51	466-490-7	
第三十五批管制物質(2025.11.5)					
251	35-1	1,1'-(ethane-1,2-diyl)bis[pentabromobenzene]	十溴二苯乙烷	84852-53-9	284-366-9
第三十六批管制物質(2026.2.4)					
252	36-1	n-hexane	正己烷	110-54-3	203-777-6
253	36-2	4,4'-[2,2,2-trifluoro-1-(trifluoromethyl)ethylidene]diphenol and its salts	4,4'-[2,2,2-三氟-1-(三氟甲基)亞乙基]雙酚及其鹽類	-	-