

No.: ETR21C01434 Date: 20-Dec-2021

OHKUCHI MATERIALS CO., LTD.

1746-2 OHKUCHI-USHIO ISA-CITY KAGOSHIMA. 895-2501 JAPAN

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

Sample Submitted By : OHKUCHI MATERIALS CO., LTD.

Sample Name : Au PLATING LAYER

Style/Item No. : GOLD COLOR METAL FOIL ON BASE MATERIAL

Other Info. : THIS TESTING SAMPLE WAS PREPARED BY OHKUCHI MATERIALS CO., LTD.

\_\_\_\_\_\_

Sample Receiving Date : 08-Dec-2021

Testing Period : 08-Dec-2021 to 15-Dec-2021

Test Requested : (1) As specified by client, with reference to RoHS 2011/65/EU Annex II and amending

Directive (EU) 2015/863 to determine Cadmium, Lead, Mercury, Cr(VI), PBBs,

PBDEs, DBP, BBP, DEHP, DIBP contents in the submitted sample(s).

(2) Please refer to next pages for the other item(s).

**Test Results** : Please refer to following pages.

Troy Change Manager Te h SGS
Signed for and on behalt of SGS TAIWAN LTD.
Chemical Laboratory - Taipei



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PIN CODE: 54B2A878

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#### **Test Part Description**

No.1 : PLATING LAYER OF GOLDEN COLORED METAL

#### Test Result(s)

Test Item(s)	Method	Unit	MDL	Result
				No.1
Cadmium (Cd) (CAS No.: 7440-43-9)	With reference to IEC 62321-5: 2013,	mg/kg	2	n.d.
Lead (Pb) (CAS No.: 7439-92-1)	analysis was performed by ICP-OES.	mg/kg	2	n.d.
Mercury (Hg) (CAS No.: 7439-97-6)	With reference to IEC 62321-4: 2013+	mg/kg	2	n.d.
	AMD1: 2017, analysis was performed by ICP-OES.			
Hexavalent Chromium Cr(VI) (CAS No.:	With reference to IEC 62321-7-1: 2015,	μg/cm²	0.1	n.d.
18540-29-9) (#2)	analysis was performed by UV-VIS.			
Monobromobiphenyl		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	With reference to IEC 62321-6: 2015,	mg/kg	I	n.d.
Monobromodiphenyl ether	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.

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Test Item(s)	Method	Unit	MDL	Result
				No.1
Butyl benzyl phthalate (BBP) (CAS No.:	With reference to IEC 62321-8: 2017,	mg/kg	50	n.d.
85-68-7)	analysis was performed by GC/MS.			
Dibutyl phthalate (DBP) (CAS No.: 84-	With reference to IEC 62321-8: 2017,	mg/kg	50	n.d.
74-2)	analysis was performed by GC/MS.			
Di-(2-ethylhexyl) phthalate (DEHP)	With reference to IEC 62321-8: 2017,	mg/kg	50	n.d.
(CAS No.: 117-81-7)	analysis was performed by GC/MS.			
Diisobutyl phthalate (DIBP) (CAS No.:	With reference to IEC 62321-8: 2017,	mg/kg	50	n.d.
84-69-5)	analysis was performed by GC/MS.			
Diisodecyl phthalate (DIDP) (CAS No.:	With reference to IEC 62321-8: 2017,	mg/kg	50	n.d.
26761-40-0, 68515-49-1)	analysis was performed by GC/MS.			
Diisononyl phthalate (DINP) (CAS No.:	With reference to IEC 62321-8: 2017,	mg/kg	50	n.d.
28553-12-0, 68515-48-0)	analysis was performed by GC/MS.			
Di-n-octyl phthalate (DNOP) (CAS No.:	With reference to IEC 62321-8: 2017,	mg/kg	50	n.d.
117-84-0)	analysis was performed by GC/MS.			
Di-n-hexyl phthalate (DNHP) (CAS No.:	With reference to IEC 62321-8: 2017,	mg/kg	50	n.d.
84-75-3)	analysis was performed by GC/MS.			
Bis(2-methoxyethyl) phthalate (DMEP)	With reference to IEC 62321-8: 2017,	mg/kg	50	n.d.
(CAS No.: 117-82-8)	analysis was performed by GC/MS.			
1,2-Benzenedicarboxylic acid, di-C7-	With reference to IEC 62321-8: 2017,	mg/kg	50	n.d.
11-branched and linear alkyl esters	analysis was performed by GC/MS.			
(DHNUP) (CAS No.: 68515-42-4)				
1,2-Benzenedicarboxylic acid, di-C6-8-	With reference to IEC 62321-8: 2017,	mg/kg	50	n.d.
branched alkyl esters, C7-rich (DIHP)	analysis was performed by GC/MS.			
(CAS No.: 71888-89-6)				
Hexabromocyclododecane (HBCDD) and	With reference to IEC 62321: 2008,	mg/kg	5	n.d.
all major diastereoisomers identified (α-	analysis was performed by GC/MS.			
HBCDD, β- HBCDD, γ- HBCDD) (CAS No.:				
25637-99-4, 3194-55-6 (134237-51-7,				
134237-50-6, 134237-52-8))				
Hexabromocyclododecane (HBCDD) and	With reference to IEC 62321-9: 2021,	mg/kg	20	n.d.
all major diastereoisomers identified (α-	analysis was performed by GC/MS.			
HBCDD, β- HBCDD, γ- HBCDD) (CAS No.: 25637-99-4, 3194-55-6 (134237-51-7,				
134237-50-6, 134237-52-8))				
13 .23 , 30 0, 13 .23 , 32 0))				

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Test Item(s)	Method	Unit	MDL	Result
				No.1
Fluorine (F) (CAS No.: 14762-94-8)	With reference to BS EN 14582: 2016,	mg/kg	50	n.d.
	analysis was performed by IC.			
Chlorine (Cl) (CAS No.: 22537-15-1)	With reference to BS EN 14582: 2016,	mg/kg	50	n.d.
	analysis was performed by IC.			
Bromine (Br) (CAS No.: 10097-32-2)	With reference to BS EN 14582: 2016,	mg/kg	50	n.d.
	analysis was performed by IC.			
lodine (I) (CAS No.: 14362-44-8)	With reference to BS EN 14582: 2016,	mg/kg	50	n.d.
	analysis was performed by IC.			
PFOS and its salts (CAS No.: 1763-23-1	With reference to CEN/TS 15968: 2010,	mg/kg	0.01	n.d.
and its salts)	analysis was performed by LC/MS/MS.			
PFOA and its salts (CAS No.: 335-67-1	With reference to CEN/TS 15968: 2010,	mg/kg	0.01	n.d.
and its salts)	analysis was performed by LC/MS/MS.			
Polychlorinated biphenyls (PCBs)	With reference to US EPA 3550C: 2007,	mg/kg	0.5	n.d.
	analysis was performed by GC/MS.			
Polychlorinated naphthalene (PCNs)	With reference to US EPA 3550C: 2007,	mg/kg	5	n.d.
	analysis was performed by GC/MS.			
Polychlorinated terphenyls (PCTs)	With reference to US EPA 3550C: 2007,	mg/kg	0.5	n.d.
	analysis was performed by GC/MS.			
Short Chain Chlorinated Paraffins(C10-	With reference to ISO 18219: 2015,	mg/kg	50	n.d.
C13) (SCCP) (CAS No.: 85535-84-8)	analysis was performed by GC/MS.			
Tributyl tin (TBT)	With reference to ISO 17353: 2004,	mg/kg	0.03	n.d.
	analysis was performed by GC/FPD.			
Bis(tributyltin) oxide (TBTO) (CAS No.:	Calculated from the result of Tributyl Tin	mg/kg	0.03 ▲	n.d.
56-35-9)	(TBT).			
Triphenyl tin (TPT)	With reference to ISO 17353: 2004,	mg/kg	0.03	n.d.
	analysis was performed by GC/FPD.			
Dibutyl tin (DBT)	With reference to ISO 17353: 2004,	mg/kg	0.03	n.d.
	analysis was performed by GC/FPD.			
Dioctyl tin (DOT)	With reference to ISO 17353: 2004,	mg/kg	0.03	n.d.
	analysis was performed by GC/FPD.			
Polyvinyl chloride (PVC)	With reference to ASTM E1252: 2013,	**	-	Negative
	analysis was performed by FT-IR and			
	Flame Test.			

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Test Item(s)	Method	Unit	MDL	Result
				No.1
Beryllium (Be) (CAS No.: 7440-41-7)	With reference to US EPA 3050B: 1996, analysis was performed by ICP-OES.	mg/kg	2	n.d.
Antimony (Sb) (CAS No.: 7440-36-0)	With reference to US EPA 3050B: 1996, analysis was performed by ICP-OES.	5 5		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.

#### Note:

- 1. mg/kg = ppm; 0.1wt% = 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. PFOS and its salts including:

CAS No.: 29081-56-9, 2795-39-3, 29457-72-5, 70225-14-8, 56773-42-3, 251099-16-8, 307-35-7.

8. PFOA and its salts including:

CAS No.: 3825-26-1, 335-95-5, 2395-00-8, 335-93-3, 335-66-0.

- 9. (#2) =
  - a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13  $\mu$ g/cm<sup>2</sup>. 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  $\mu$ g/cm<sup>2</sup>). The coating is considered a non-Cr(VI) based coating
  - c. The result between 0.10  $\mu$ g/cm<sup>2</sup> and 0.13  $\mu$ g/cm<sup>2</sup> is considered to be inconclusive unavoidable coating variations may influence the determination.
- 10. ▲: The MDL was evaluated for element / tested substance.

Conversion Formula :  $AX = A \times F$ 

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

Parameter Conversion Table: https://eecloud.sgs.com/Region\_TW/DocDownload.aspx#otherDoc

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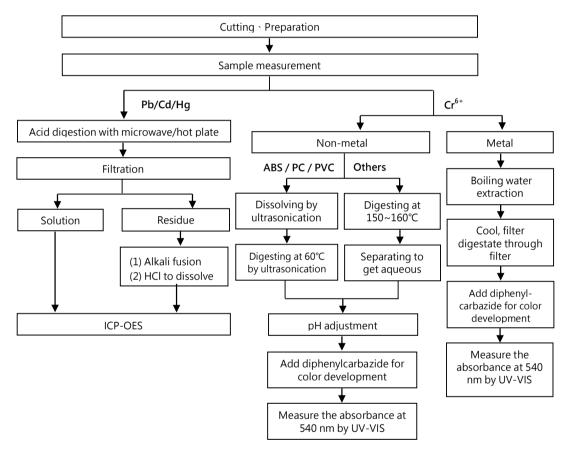
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#### Analytical flow chart of Heavy Metal

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

( Cr<sup>6+</sup> test method excluded )



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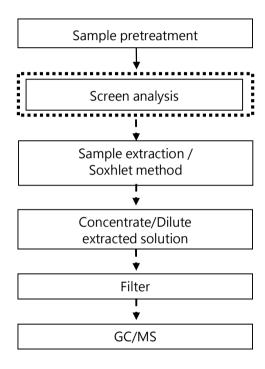
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#### Analytical flow chart - PBBs / PBDEs

First testing process

Optional screen process

Confirmation process



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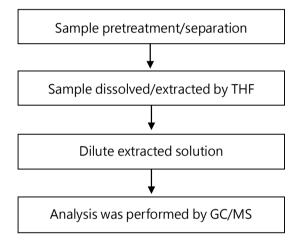


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Analytical flow chart - Phthalate

[Test method: IEC 62321-8]



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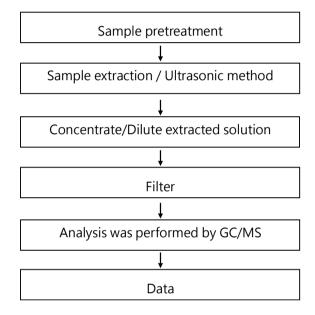
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#### Analytical flow chart - HBCDD



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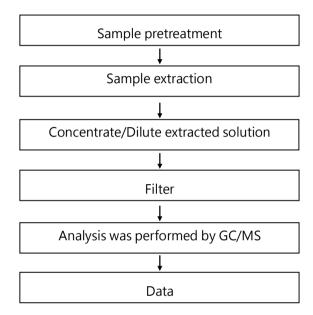
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#### Analytical flow chart - HBCDD



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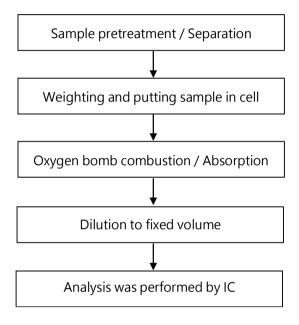
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#### Analytical flow chart - Halogen



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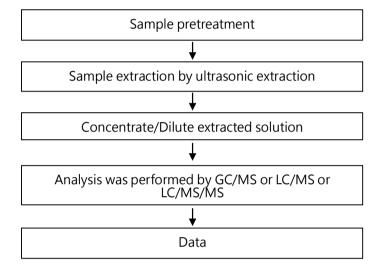
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#### Analytical flow chart – PFAS (including PFOA/PFOS/its related compound, etc.)



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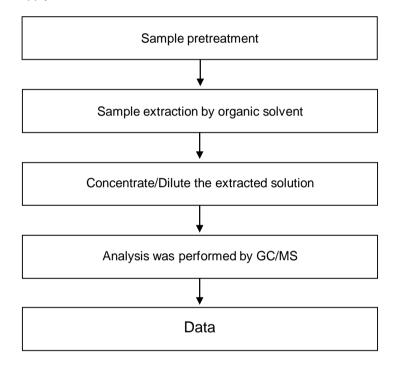


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#### **Analytical flow chart**

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



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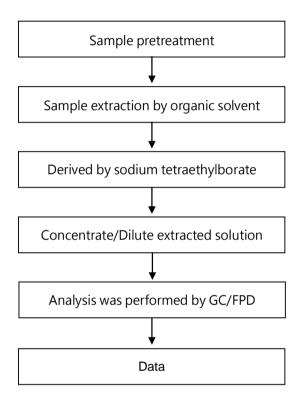
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No.: ETR21C01434 Date: 20-Dec-2021

OHKUCHI MATERIALS CO., LTD. 1746-2 OHKUCHI-USHIO ISA-CITY KAGOSHIMA. 895-2501 JAPAN

#### Analytical flow chart - Organic-Tin



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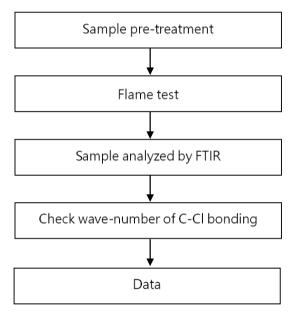
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OHKUCHI MATERIALS CO., LTD. 1746-2 OHKUCHI-USHIO ISA-CITY KAGOSHIMA. 895-2501 JAPAN

#### Analysis flow chart - PVC



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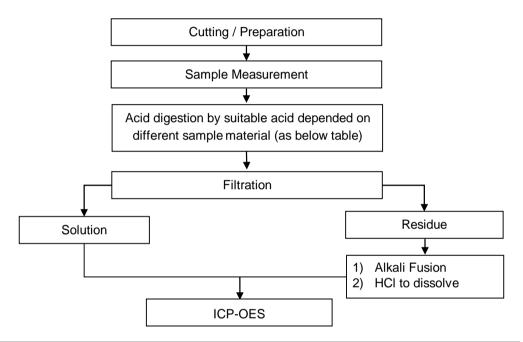


No.: ETR21C01434 Date: 20-Dec-2021

OHKUCHI MATERIALS CO., LTD. 1746-2 OHKUCHI-USHIO ISA-CITY KAGOSHIMA. 895-2501 JAPAN

#### Flow Chart of digestion for the elements analysis performed by ICP-OES

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



Steel, copper, aluminum, solder	Aqua regia, HNO <sub>3</sub> , HCl, HF, H <sub>2</sub> O <sub>2</sub>
Glass	HNO <sub>3</sub> /HF
Gold, platinum, palladium, ceramic	Aqua regia
Silver	HNO <sub>3</sub>
Plastic	H <sub>2</sub> SO <sub>4</sub> , H <sub>2</sub> O <sub>2</sub> , HNO <sub>3</sub> , HCI
Others	Added appropriate reagent to total digestion

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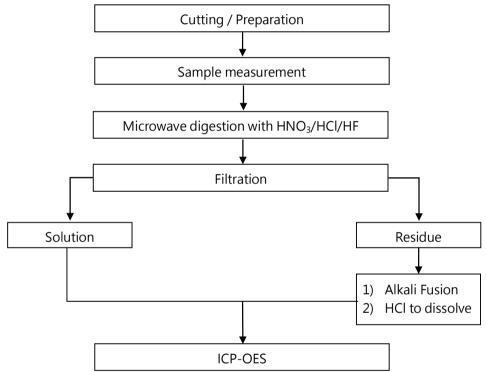
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OHKUCHI MATERIALS CO., LTD. 1746-2 OHKUCHI-USHIO ISA-CITY KAGOSHIMA. 895-2501 JAPAN

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

### ETR21C01434



\*\* End of Report \*\*

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