

## Test Report

No. : CE/2011/32875 Date : 2011/03/17 Page : 1 of 11

SHINKO ELECTRIC INDUSTRIES CO., LTD.  
80 OSHIMADA-MACHI, NAGANO-SHI, 381-2287 JAPAN



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

Sample Description : MF202  
Sample Receiving Date : 2011/03/10  
Testing Period : 2011/03/10 TO 2011/03/17

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

Conclusion : Based upon the performed tests by submitted samples, the test results of Cadmium, Lead, Mercury, Hexavalent Chromium Cr(VI), PBBs and PBDEs comply with the limits of RoHS Directive 2002/95/EC and its subsequent amendments.

  
  
Chenyu Kung / Operation Manager  
Signed for and on behalf of  
SGS TAIWAN LTD.  
Chemical Laboratory – Taipei

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## Test Result(s)

PART NAME No.1 : COPPER COLORED METAL

Test Item (s):	Unit	Method	MDL	Result	Limit
				No.1	
Cadmium (Cd)	mg/kg	With reference to IEC 62321: 2008 and performed by ICP-AES.	2	n.d.	100
Lead (Pb)	mg/kg	With reference to IEC 62321: 2008 and performed by ICP-AES.	2	11	1000
Mercury (Hg)	mg/kg	With reference to IEC 62321: 2008 and performed by ICP-AES.	2	n.d.	1000
Hexavalent Chromium Cr(VI) by boiling water extraction	**	With reference to IEC 62321: 2008 and performed by boiling water extraction Method. (See Note 7)	0.02mg/kg with 50 cm <sup>2</sup> surface area	Negative	#
Antimony (Sb)	mg/kg	With reference to US EPA Method 3050B for Antimony Content. Analysis was performed by ICP-AES.	2	n.d.	-
Perfluorooctane sulfonates (PFOS) PFOS – Acid PFOS – Metal Salt PFOS – Amide	mg/kg	With reference to US EPA 3540C: 1996 method for PFOS Content. Analysis was performed by LC/MS.	10	n.d.	-
PFOA (CAS No.: 000335-67-1)	mg/kg	With reference to US EPA 3540C: 1996 method for PFOA Content. Analysis was performed by LC/MS.	10	n.d.	-
PVC	**	Analysis was performed by FTIR and FLAME Test.	-	Negative	-
<b>Halogen</b>					
Halogen-Fluorine (F) (CAS No.: 014762-94-8)	mg/kg	With reference to BS EN 14582:2007. Analysis was performed by IC.	50	n.d.	-
Halogen-Chlorine (Cl) (CAS No.: 022537-15-1)			50	n.d.	-
Halogen-Bromine (Br) (CAS No.: 010097-32-2)			50	n.d.	-
Halogen-Iodine (I) (CAS No.: 014362-44-8)			50	n.d.	-

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Test Item (s):	Unit	Method	MDL	Result	Limit		
				No.1			
<b>Sum of PBBs</b>	mg/kg	With reference to IEC 62321: 2008 and performed by GC/MS.	-	n.d.	1000		
Monobromobiphenyl			5	n.d.	-		
Dibromobiphenyl			5	n.d.	-		
Tribromobiphenyl			5	n.d.	-		
Tetrabromobiphenyl			5	n.d.	-		
Pentabromobiphenyl			5	n.d.	-		
Hexabromobiphenyl			5	n.d.	-		
Heptabromobiphenyl			5	n.d.	-		
Octabromobiphenyl			5	n.d.	-		
Nonabromobiphenyl			5	n.d.	-		
Decabromobiphenyl			5	n.d.	-		
<b>Sum of PBDEs</b>					-	n.d.	1000
Monobromodiphenyl ether					5	n.d.	-
Dibromodiphenyl ether					5	n.d.	-
Tribromodiphenyl ether					5	n.d.	-
Tetrabromodiphenyl ether					5	n.d.	-
Pentabromodiphenyl ether					5	n.d.	-
Hexabromodiphenyl ether					5	n.d.	-
Heptabromodiphenyl ether					5	n.d.	-
Octabromodiphenyl ether					5	n.d.	-
Nonabromodiphenyl ether					5	n.d.	-
Decabromodiphenyl ether					5	n.d.	-

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### Note :

1. mg/kg = ppm ; 0.1wt% = 1000ppm
2. n.d. = Not Detected
3. MDL = Method Detection Limit
4. " - " = Not Regulated
5. \*\* = Qualitative analysis (No Unit)
6. Negative = Undetectable / Positive = Detectable
7. Boiling-water-extraction:  
Negative = Absence of Cr(VI) coating / surface layer; Positive = Presence of Cr(VI) coating / surface layer;  
The detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm<sup>2</sup> sample surface area.
8. # = Positive indicates the presence of Cr(VI) on the tested areas and result be regarded as not comply with RoHS requirement.  
Negative indicates the absence of Cr(VI) on the tested areas and result be regarded as comply with RoHS requirement.

### PFOS Reference Information : Directive 2006/122/EC

(1) May not be placed on the market or used as a substance or constituent of preparations in a concentration equal to or higher than 0.005 % by mass.

(2) May not be placed on the market in semi-finished products or articles, or parts thereof, if the concentration of PFOS is equal to or higher than 0.1 % by mass calculated with reference to the mass of structurally or microstructurally distinct parts that contain PFOS or, for textiles or other coated materials, if the amount of PFOS is equal to or higher than 1µg/m<sup>2</sup> of the coated material.

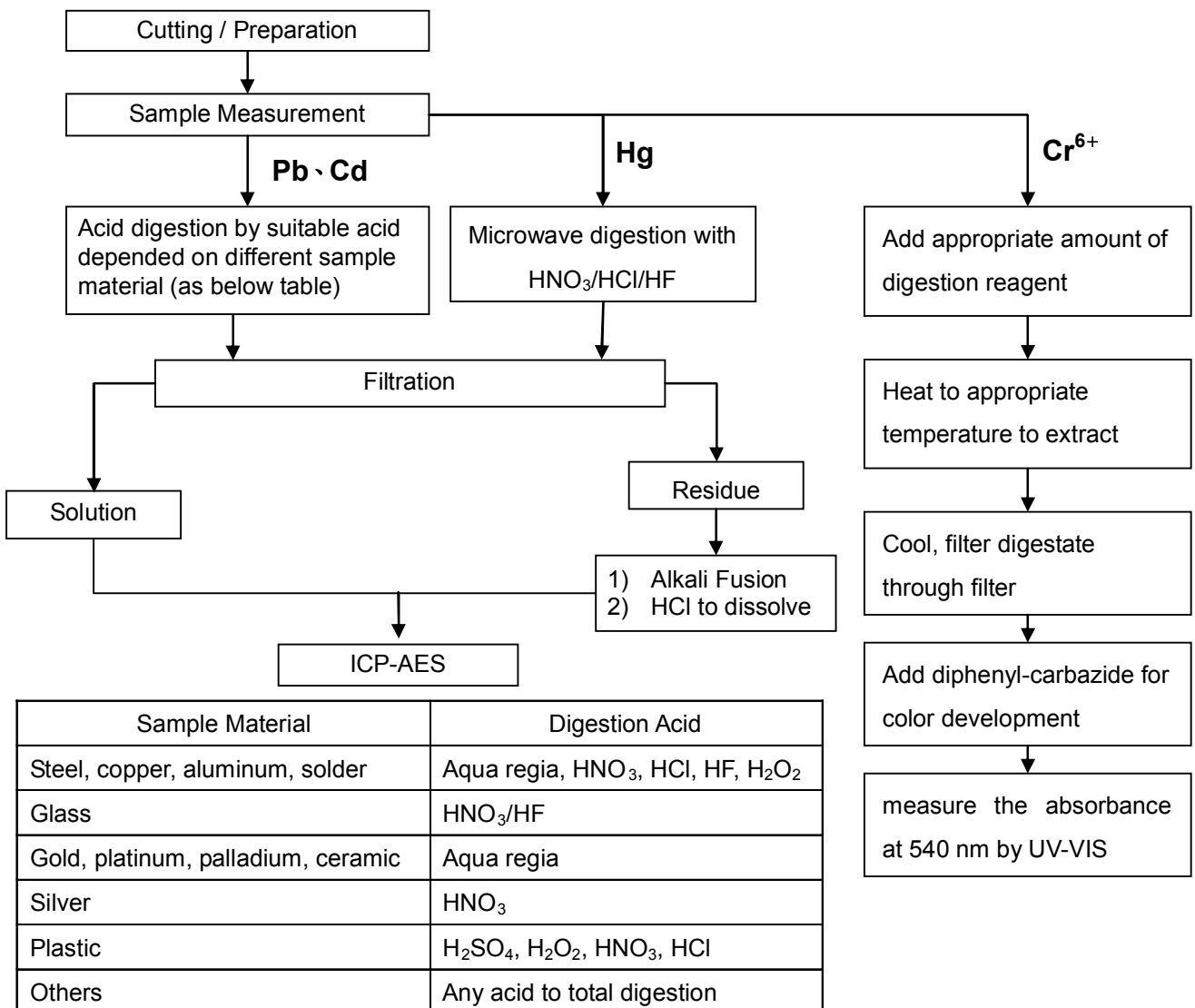
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- 1) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr<sup>6+</sup> test method excluded)
- 2) Name of the person who made measurement: Climbgreat Yang
- 3) Name of the person in charge of measurement: Troy Chang



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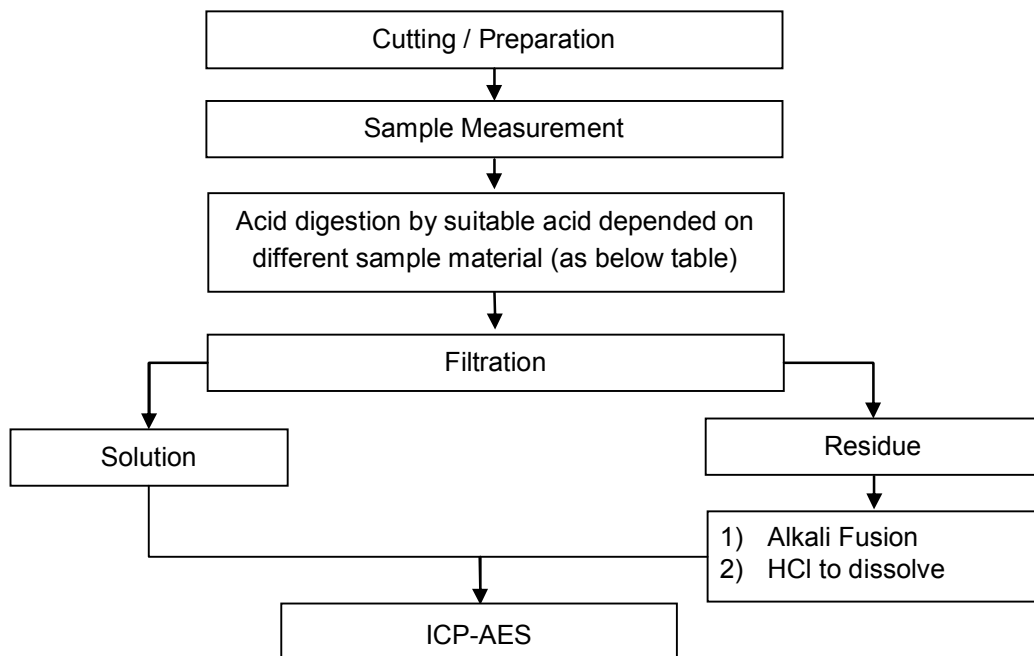
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- 1) These samples were dissolved totally by pre-conditioning method according to below flow chart.
- 2) Name of the person who made measurement: Climbgreat Yang
- 3) Name of the person in charge of measurement: Troy Chang

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



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> , HCl
Others	Any acid to total digestion

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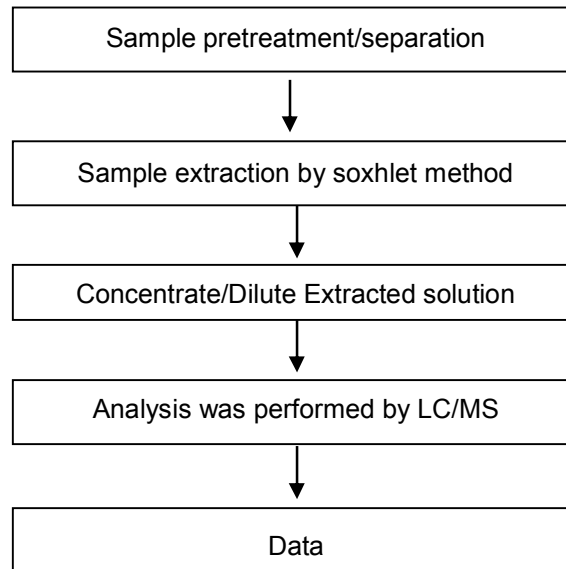
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### Analytical flow chart of Soxhlet extraction (LC/MS) procedure

- 1) Name of the person who made measurement: Roman Wong
- 2) Name of the person in charge of measurement: Shinjyh Chen

■ Test Items: PFOS/PFOA 、 Benzotriazole



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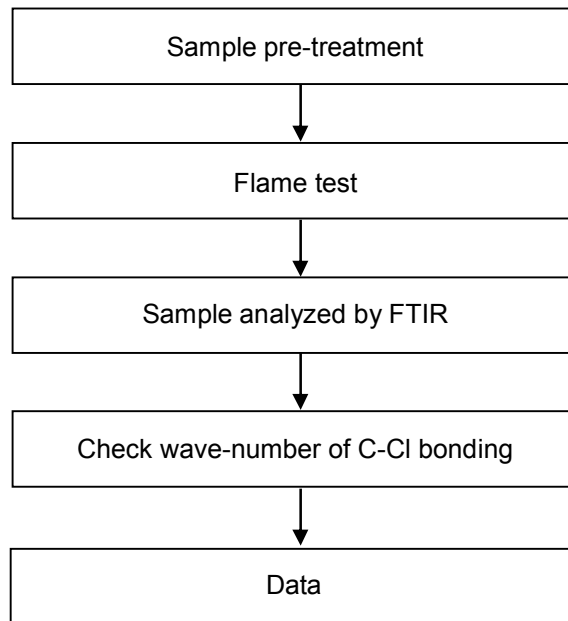
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### Analysis flow chart for determination of PVC in material

- 1) Name of the person who made measurement: Ginny Chen
- 2) Name of the person in charge of measurement: Shinjyh Chen



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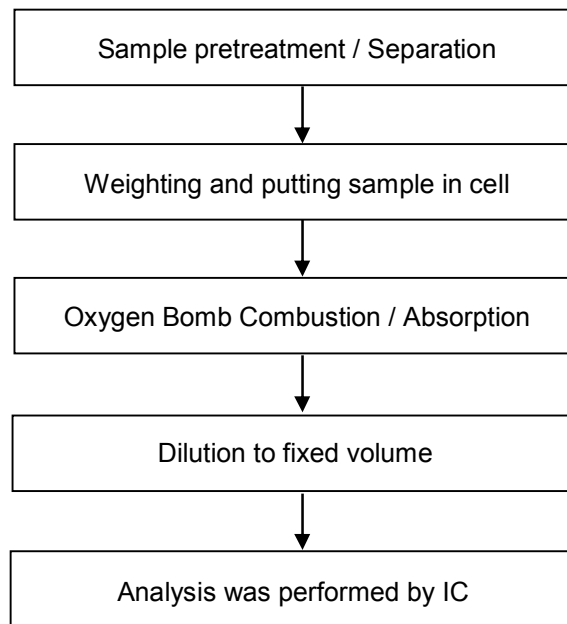
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### Analytical flow chart of halogen content

- 1) Name of the person who made measurement: Rita Chen
- 2) Name of the person in charge of measurement: Troy Chang



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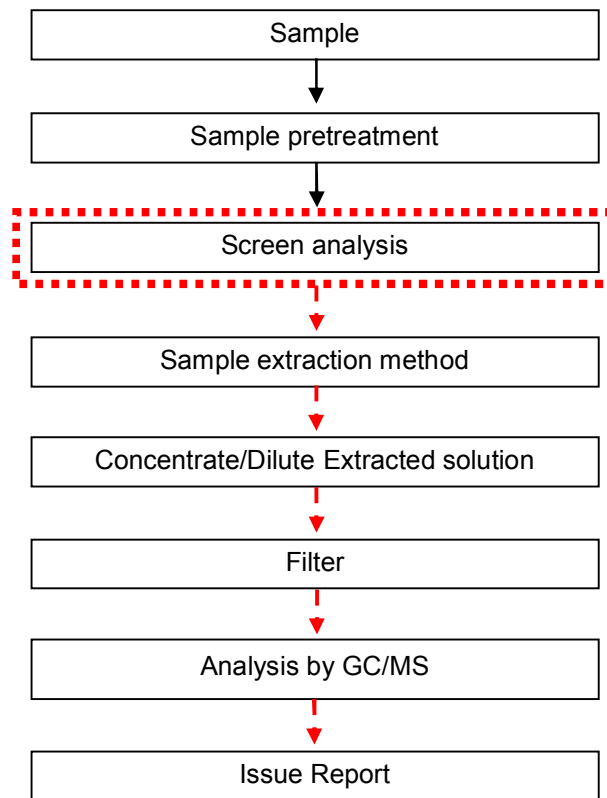


### Analytical flow chart

- 1) Name of the person who made measurement: Roman Wong
- 2) Name of the person in charge of measurement: Troy Chang

■ Test Items: PBB/PBDE, TBBP-A-bis

First testing process —> Optional screen process ..... Confirmation process - ->



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