

Test Report

No: 10557895(4)

Date: 14-Apr-2023

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Singapore Asahi Chemical & Solder Industries Pte Ltd
47 Pandan Road Singapore 609288

Sample Name : Sn97Cu3

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

Sample Receiving Date : 30-Mar-2023
Testing Period : 30-Mar-2023 to 14-Apr-2023
Test Requested : Selected 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).

Conclusion : Based on the performed tests on submitted sample(s), the results of Cadmium, Lead, Mercury, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs) and Phthalates such as Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) and Diisobutyl phthalate (DIBP) **comply** with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

Signed for and on behalf of
SGS Testing & Control Services Singapore Pte Ltd



Y.C. Tham
Technical Manager, Multi-Lab



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Test Result(s):

Sample Description : Silver color metal ribbon

Test Item(s):	Unit	Method	Results	MDL	RoHS Limit
Cadmium(Cd)	mg/kg	With reference to IEC62321-5 :2013. Analysis was performed by ICP/OES	n.d.	2	100
Lead (Pb)	mg/kg	With reference to IEC62321-5 :2013. Analysis was performed by ICP/OES	35.8	2	1000
Mercury (Hg)	mg/kg	With reference to IEC62321-4 :2013 +A1:2017. Analysis was performed by ICP/OES	n.d.	2	1000
Hexavalent Chromium (Cr(VI)) #	µg/cm2	With reference to IEC62321-7-1 :2015. Analysis was performed by UV-Vis Spectrometry.	n.d.	0.1	-
Sum of PBBs	mg/kg	With reference to IEC62321-6 :2015. Analysis was performed by GC/MS	n.d.	-	1000
Monobromobiphenyl	mg/kg		n.d.	5	-
Dibromobiphenyl	mg/kg		n.d.	5	-
Tribromobiphenyl	mg/kg		n.d.	5	-
Tetrabromobiphenyl	mg/kg		n.d.	5	-
Pentabromobiphenyl	mg/kg		n.d.	5	-
Hexabromobiphenyl	mg/kg		n.d.	5	-
Heptabromobiphenyl	mg/kg		n.d.	5	-
Octabromobiphenyl	mg/kg		n.d.	5	-
Nonabromobiphenyl	mg/kg		n.d.	5	-
Decabromobiphenyl	mg/kg		n.d.	5	-
Sum of PBDEs	mg/kg		n.d.	-	1000
Monobromodiphenyl ether	mg/kg		n.d.	5	-
Dibromodiphenyl ether	mg/kg		n.d.	5	-
Tribromodiphenyl ether	mg/kg		n.d.	5	-
Tetrabromodiphenyl ether	mg/kg		n.d.	5	-
Pentabromodiphenyl ether	mg/kg		n.d.	5	-
Hexabromodiphenyl ether	mg/kg		n.d.	5	-
Heptabromodiphenyl ether	mg/kg		n.d.	5	-
Octabromodiphenyl ether	mg/kg		n.d.	5	-
Nonabromodiphenyl ether	mg/kg	n.d.	5	-	
Decabromodiphenyl ether	mg/kg	n.d.	5	-	

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Test Result(s):

Sample Description : Silver color metal ribbon

Test Item(s):	Unit	Method	Results	MDL	Limit
BBP (Benzyl butyl phthalate)	mg/kg	With reference to IEC62321-8 :2017. Analysis was performed by GC/MS	n.d.	50	1000
DBP (Di-butyl phthalate)	mg/kg	With reference to IEC62321-8 :2017. Analysis was performed by GC/MS	n.d.	50	1000
DEHP (Di-(2-ethylhexyl) phthalate)	mg/kg	With reference to IEC62321-8 :2017. Analysis was performed by GC/MS	n.d.	50	1000
DIBP (Di-isobutyl Phthalate)	mg/kg	With reference to IEC62321-8 :2017. Analysis was performed by GC/MS	n.d.	50	1000

- Note:
- (1) mg/kg = ppm ; 0.1wt% = 1000ppm
 - (2) n.d.= Not Detected
 - (3) MDL = Method Detection Limit
 - (4) “-“ = Not regulated
 - (5) * : Exceeds limit
 - (6) # = a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13µg/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 0.10µg/cm2.
 The coating is considered a non-Cr(VI) based coating
 c. The result between 0.10µg/cm2 and 0.13µg/cm2 is considered to be inconclusive
 - unavoidable coating variations may influence the determination
 - (7) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.
 - (8) IEC 62321 series is equivalent to EN 62321 series.
https://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25

Unless otherwise stated, the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule (=0) stated in ILAC-G8:09/2019. According to this rule, the judgement of conformity is based on the comparing test results with limits.

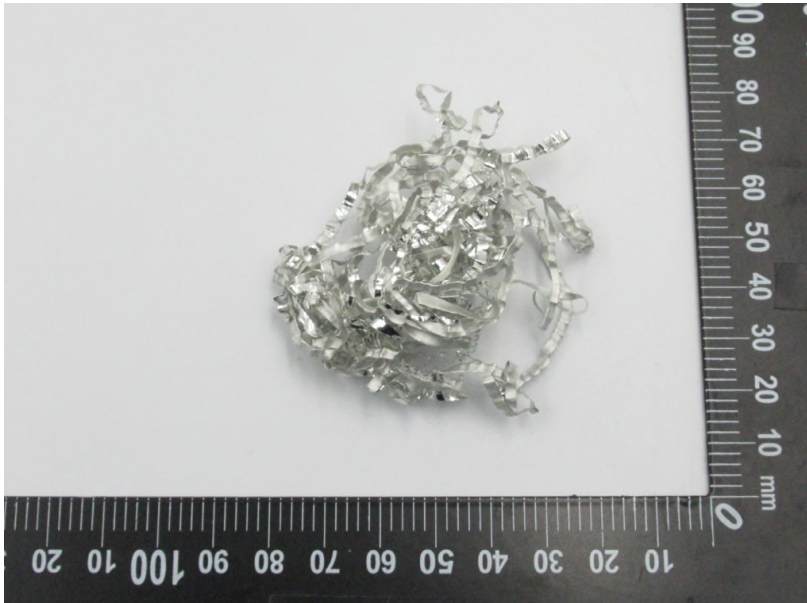
Remarks: Sample received was totally dissolved by preconditioning method.
 Lab Analyst(s): Auni, Farah and MC

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Sample photo:

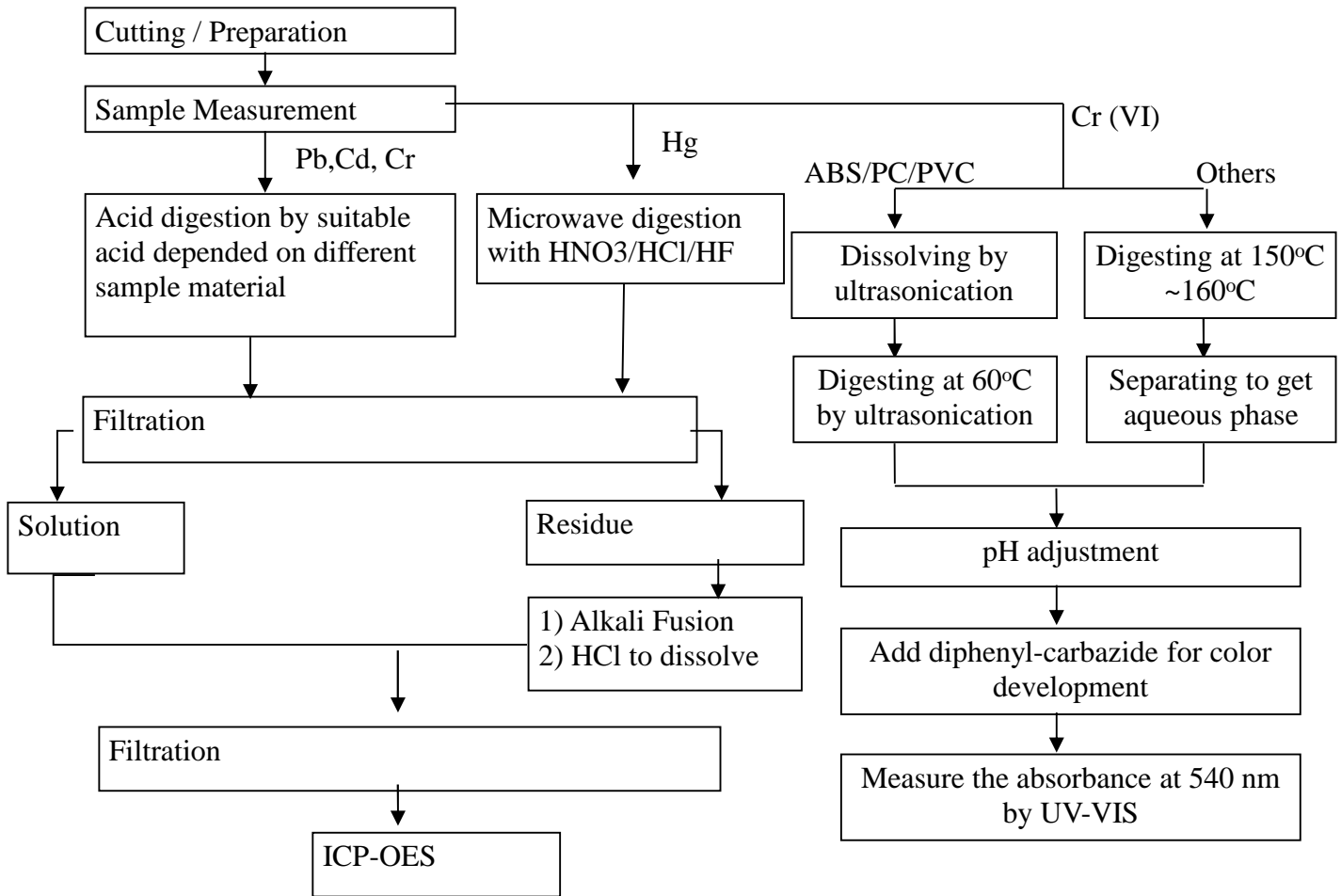
Sample Description : Silver color metal ribbon

SGS authenticate the photo on original report only



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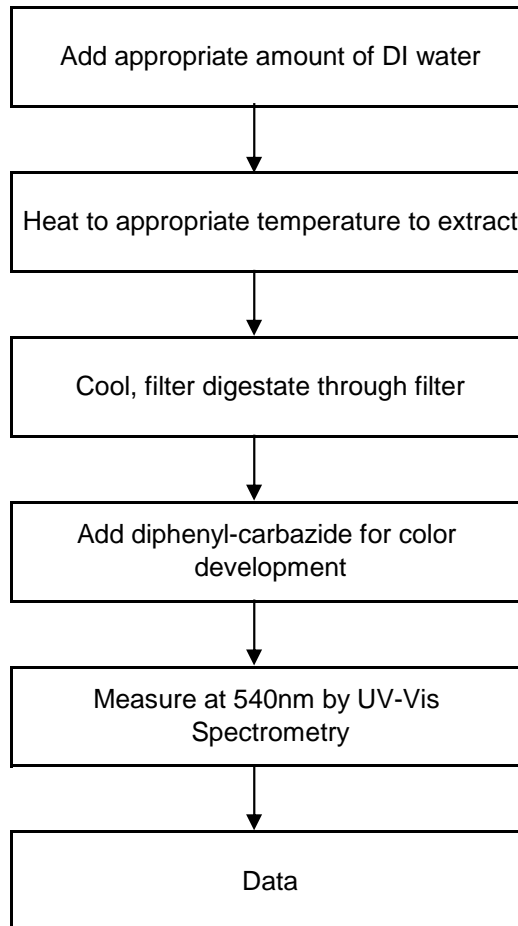
Process Flow of IEC 62321 (Pb, Cd, Hg, Cr & Cr(VI))



Remarks: Sample received was totally dissolved by preconditioning method. (CrVI method excluded)

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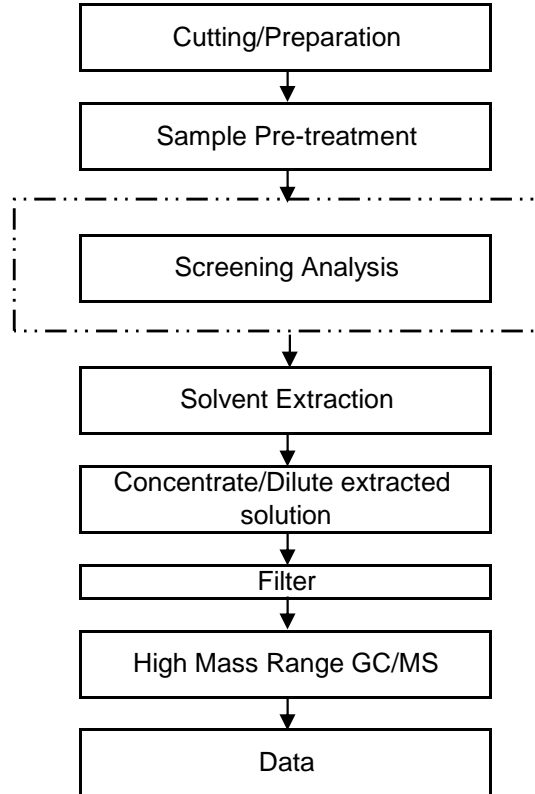
Process Flow of Cr(VI) by Boiling Water Extraction (IEC62321)



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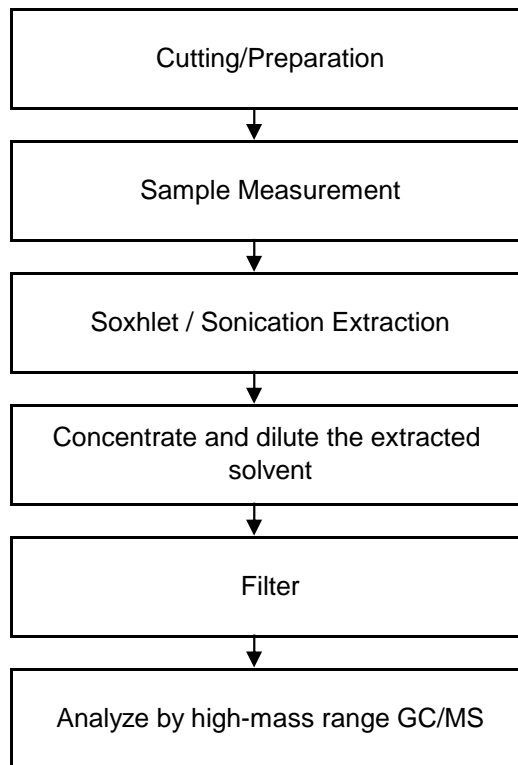
Process Flow of PBBs and PBDEs by GC/MS (IEC 62321)

First Testing Process → Optional screen process Confirmation process ...→



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Process Flow of Phthalate Analysis (IEC 62321)



End of Report

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