

## Test Report

No: 10503597(1)

Date: 06-Nov-2020

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Heraeus Materials Singapore Pte Ltd  
26 Pioneer Crescent #06-11/12 West Park Bizcentral Singapore 628558

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

Sample Name : Solder Wire PbSn2Ag2.5

Sample Receiving Date : 22-Oct-2020  
Testing Period : 22-Oct-2020 to 29-Oct-2020

Test Requested : (1) In accordance with the RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.  
(2) As specified by client, to test Antimony, Beryllium in the submitted sample.

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

Conclusion : (1) Based on the performed tests on submitted sample(s), the results of Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP **comply with** the 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



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Y.C. Tham  
Technical Manager, Multi-Lab

Test Location: 3 Toh Tuck Link, #01-02, Singapore 596228

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**Test Result(s):**

Sample Description : Silver colored metal wire

Test Item(s):	Unit	Method	Results	MDL	RoHS Limit
Cadmium(Cd)	mg/kg	With reference to IEC62321-5 :2013. Analysis was performed by ICP/AES	n.d.	2	100
Lead (Pb)	mg/kg	With reference to IEC62321-5 :2013. Analysis was performed by ICP/AES	954687.5*	2	1000
Mercury (Hg)	mg/kg	With reference to IEC62321-4 :2013 +A1:2017. Analysis was performed by ICP/AES	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	-
<b>Sum of PBBs</b>	mg/kg	With reference to IEC62321-6 :2015. Analysis was performed by GC/MS	<b>n.d.</b>	-	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	-
<b>Sum of PBDEs</b>	mg/kg		<b>n.d.</b>	-	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 colored metal wire

Test Item(s):	Unit	Method	Results	MDL	Limit
BBP (Benzyl butyl phthalate)	mg/kg	With reference to IEC 62321-8 :2017. Analysis was performed by GC/MS	n.d.	50	1000
DBP (Di-butyl phthalate)	mg/kg	With reference to IEC 62321-8 :2017. Analysis was performed by GC/MS	n.d.	50	1000
DEHP (Di-(2-ethylhexyl) phthalate)	mg/kg	With reference to IEC 62321-8 :2017. Analysis was performed by GC/MS	n.d.	50	1000
DIBP (Di-isobutyl Phthalate)	mg/kg	With reference to IEC 62321-8 :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/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 0.10µg/cm<sup>2</sup>.  
 The coating is considered a non-Cr(VI) based coating  
 c. The result between 0.10µg/cm<sup>2</sup> and 0.13µg/cm<sup>2</sup> is considered to be inconclusive  
 - unavoidable coating variations may influence the determination
  - (7) Reference information: The limits of Benzyl butyl phthalate (BBP), Di-butyl phthalate (DBP), Di-(2-ethylhexyl) phthalate (DEHP) , Di-isobutyl phthalate (DIBP) as set by G/TBT/N/EU/256 of WTO/TBT .

**\*Exemption: The received sample is exempted under directive 2011/65/EC Annex III Article 4(1): 7(a)lead in high melting temperature solder type solders (i.e. tin-lead solder alloys containing more than 85% of lead).**

Remarks: Sample received was totally dissolved by preconditioning method.

Lab Analyst(s): AQ, Pheng and SJ

Test Location: 3 Toh Tuck Link, #01-02, Singapore 596228

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## Test Result(s):

Sample Description : Silver colored metal wire

Test Item(s):	Unit	Method	Results	MDL
Antimony (Sb)	mg/kg	With reference to US EPA 3050B. Analysis was performed by ICP/AES	n.d.	2
Beryllium (Be)	mg/kg	With reference to US EPA 3050B. Analysis was performed by ICP/AES	n.d.	2

Note: (1) mg/kg = ppm ; 0.1 wt% = 1000ppm  
 (2) n.d.= Not Detected  
 (3) MDL = Method Detection Limit

Lab Analyst(s): AQ, Pheng and SJ

Test Location: 3 Toh Tuck Link, #01-02, Singapore 596228

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**Sample photo:**

Sample Description : Silver colored metal wire

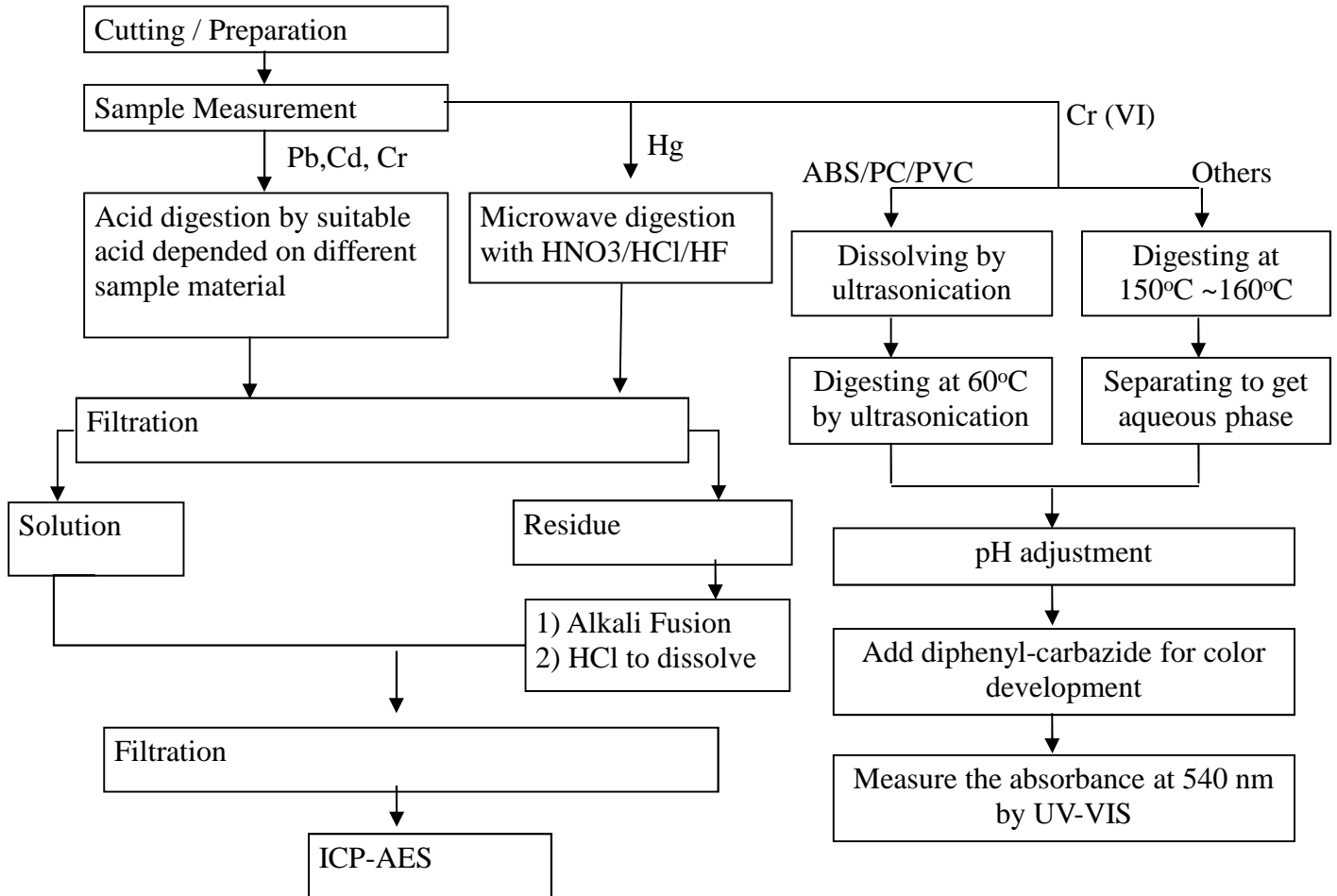
SGS authenticate the photo on original report only



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



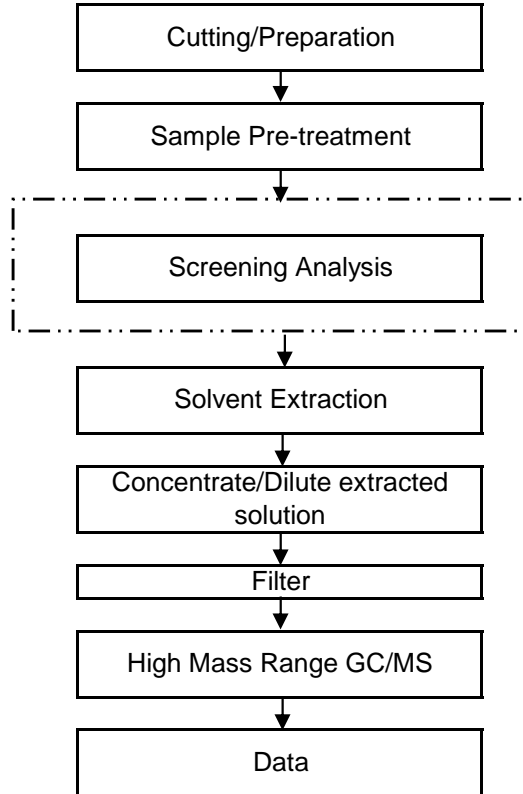
Remarks: Sample received was totally dissolved by preconditioning method. (CrVI method excluded)

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

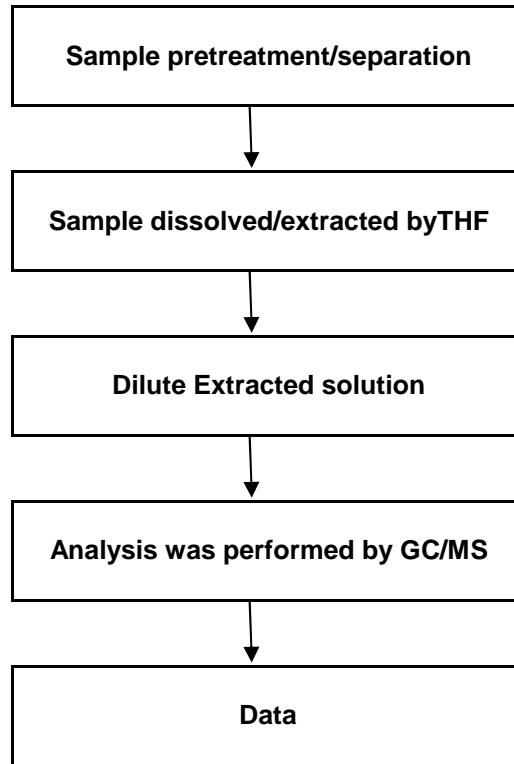
First Testing Process → Optional screen process ..... Confirmation process ...→



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### Analytical flow chart - Phthalate (IEC62321)

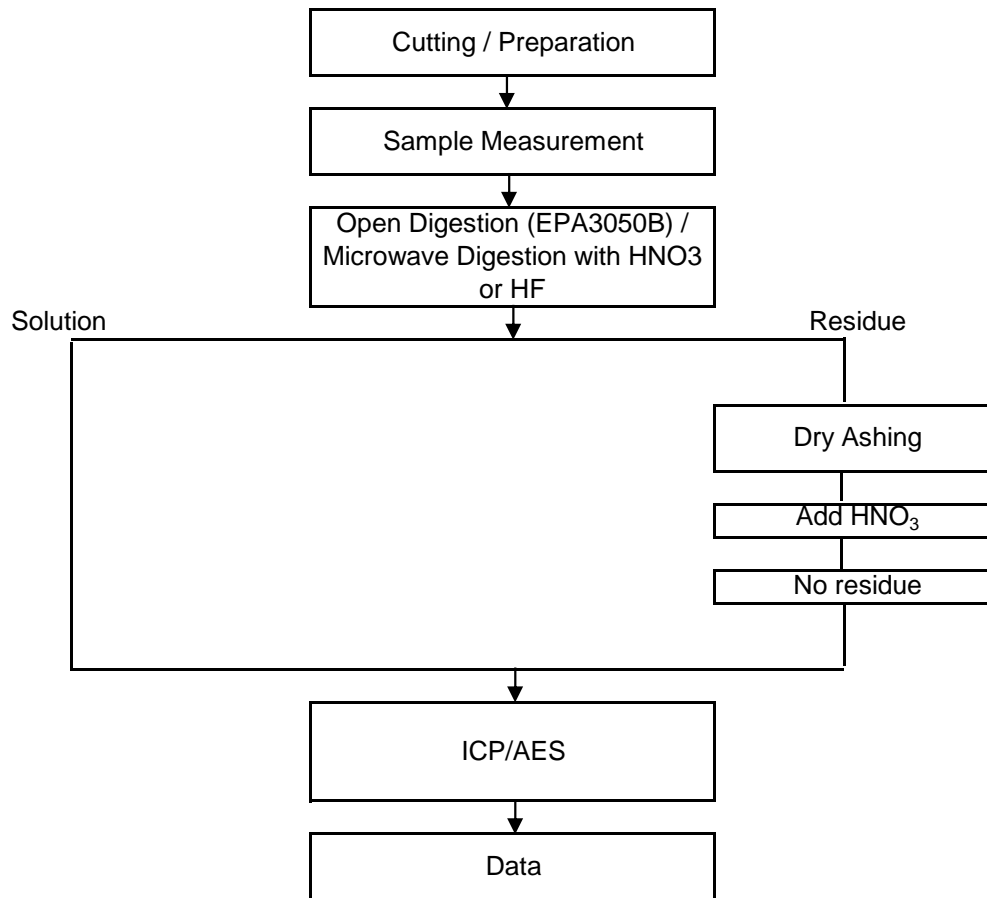


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### Process Flow of US EPA 3050B/3051A/3052



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

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