

Test Report

No: 10565321(1)

Date: 08-Aug-2023

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Nihon Handa Co., Ltd.
Arca Central 16F,1-2-1, Kinshi, Sumida-ku,Tokyo130-0013, Japan

Sample Name : Solder Paste, SULAP-S3AG0.5CU-0212-F-(92M(S)-D2)(200)

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

Sample Receiving Date : 01-Aug-2023
Testing Period : 01-Aug-2023 to 08-Aug-2023
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 Halogen- Chlorine and Bromine
(3) As specified by client, to test Antimony (Sb), Beryllium (Be)
(4) As specified by client, to test PFOS and PFOA in the submitted sample.

Test Method : 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 : Gray paste

| 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 | 5.4 | 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)) | mg/kg | With reference to IEC62321-7-2 :2017. Analysis was performed by UV/Vis Spectrometry | n.d. | 8 | 1000 |
| 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 : Gray paste

| 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) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.
 - (7) 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

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

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Test Result(s):

Sample Description : Gray paste

| Test Item(s): | Unit | Method | Results | MDL |
|---|-------|---|---------|------|
| Halogen | | | | |
| Halogen - Bromine (Br) | mg/kg | With reference to BS EN 14582. Analysis was performed by IC | 732 | 50 |
| Halogen - Chlorine (Cl) | mg/kg | With reference to BS EN 14582. Analysis was performed by IC | n.d. | 50 |
| | | | | |
| Antimony (Sb) | mg/kg | With reference to US EPA 3052. Analysis was performed by ICP/OES | n.d. | 2 |
| Beryllium (Be) | mg/kg | With reference to US EPA 3052. Analysis was performed by ICP/OES | n.d. | 2 |
| | | | | |
| PFOS and its salts* (CAS No.: 1763-23-1 and its salts) | mg/kg | With reference to CEN/TS 15968:2010. Analysis was performed by LC/MS/MS | n.d. | 0.01 |
| PFOA and its salts* (CAS No.: 335-67-1 and its salts) | mg/kg | With reference to CEN/TS 15968:2010. Analysis was performed by LC/MS/MS | n.d. | 0.01 |

- Note:
- (1) mg/kg = ppm ; 0.1wt% = 1000ppm
 - (2) n.d.= Not Detected
 - (3) MDL = Method Detection Limit
 - (4) PFOS and its salts including :
CAS No.: 1763-23-1, 2795-39-3, 29547-72-5, 29081-56-9, 70225-14-8, 56773-42-3, 210599-16-8, 307-35-7, 91036-71-4, 4021-47-0 and others.
 - (5) PFOA and its salts including :
CAS No.: 335-67-1, 335-95-5, 2395-00-8, 335-93-3, 335-66-0, 3825-26-1 and others.

Lab Analyst(s): SR and Farah

*** Tested by SGS lab (ETR23800850)**

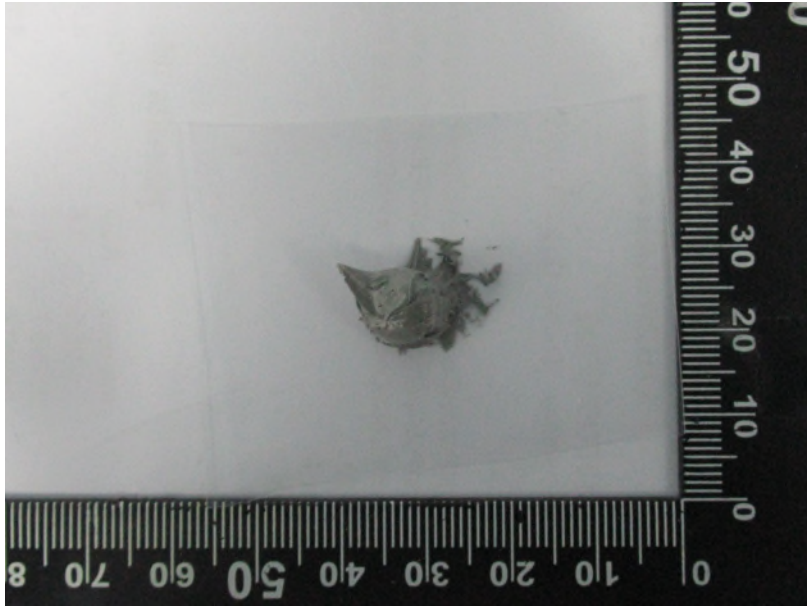
Unless otherwise stated, the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule ($w=0$) stated in ILAC-G8:09/2019. According to this rule, the judgement of conformity is based on the comparing test results with limits.

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Sample photo:

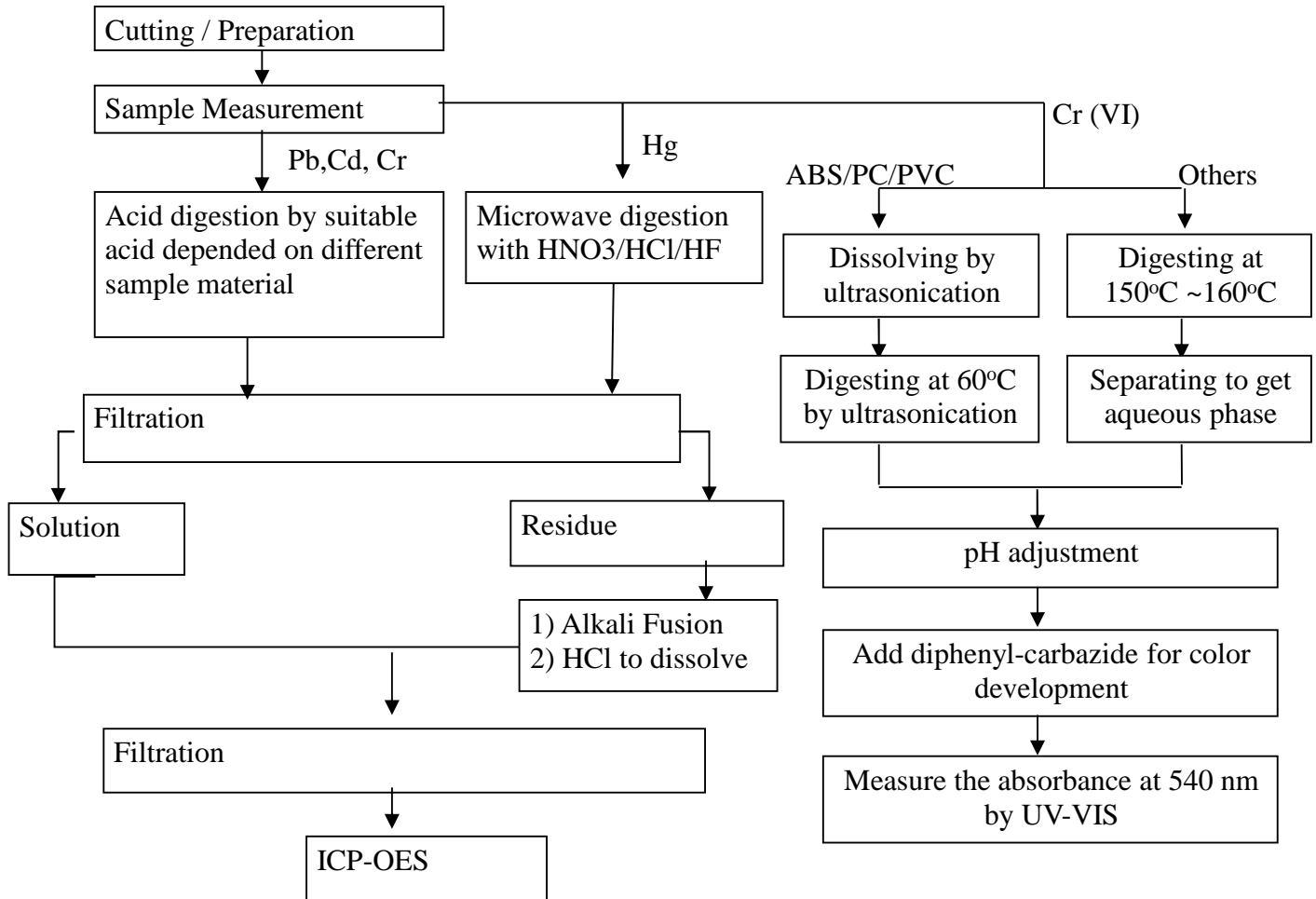
Sample Description : Gray paste

SGS authenticate the photo on original report only



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

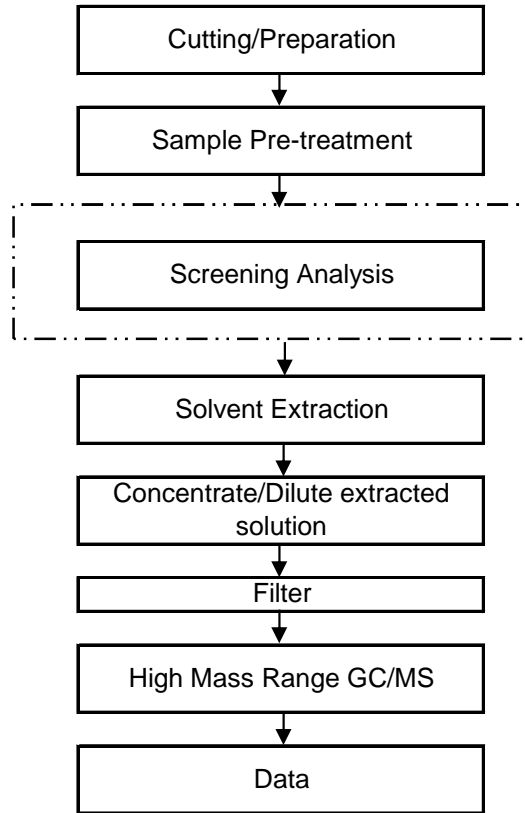


Remarks: Sample received was totally dissolved by preconditioning method. (CrVI method excluded)

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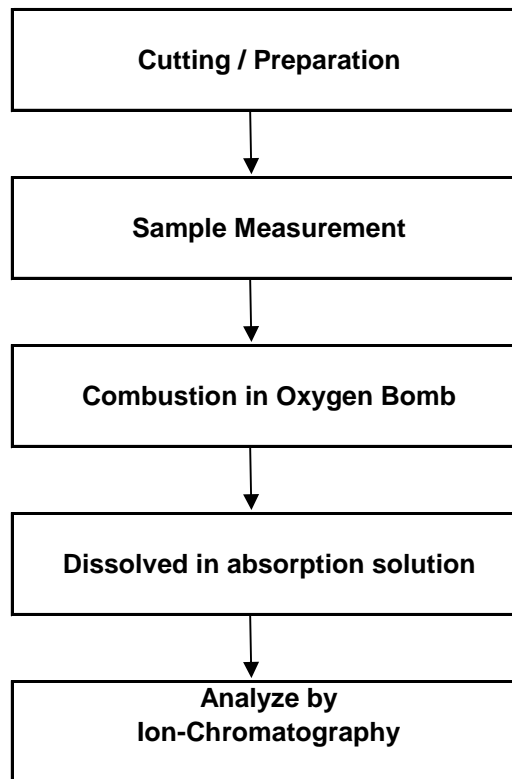
Process Flow of PBBs and PBDEs by GC/MS (IEC 62321)

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



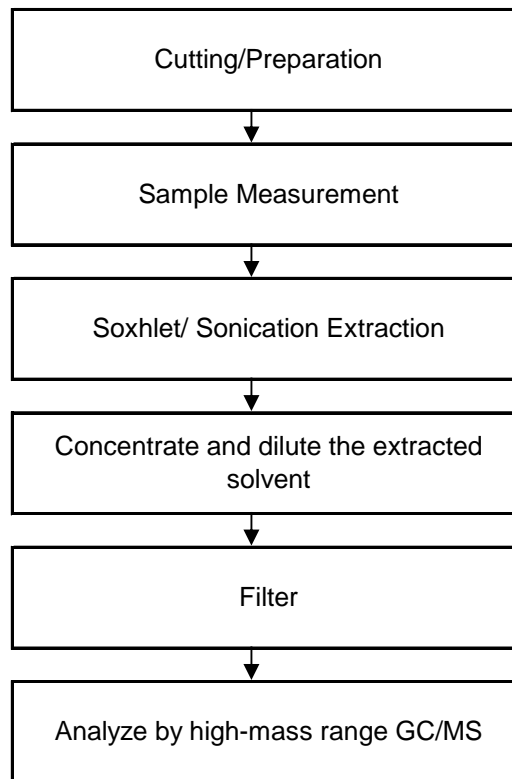
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Process Flow of BS EN 14582 (Halogen Analysis)



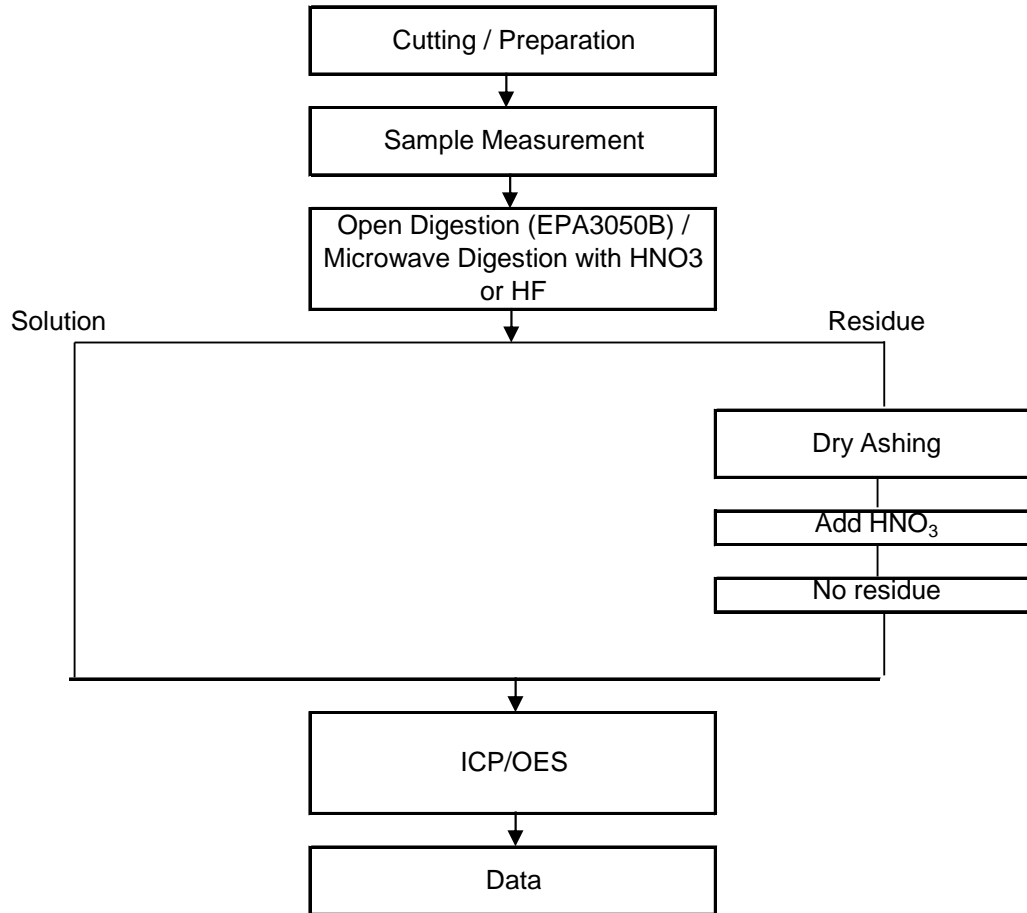
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Process Flow of Phthalate



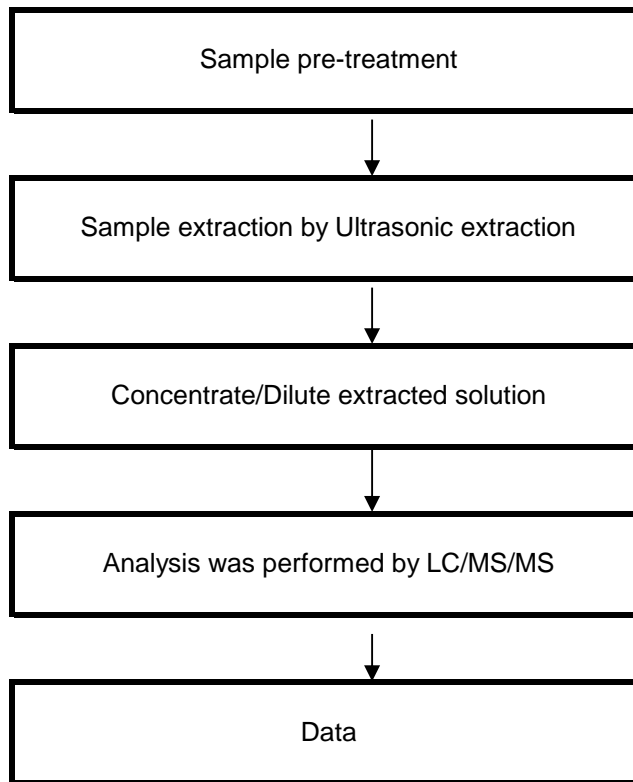
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Process Flow of US EPA 3050B/3051A/3052



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Process Flow of PFOS/PFOA



End of Report

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