



# TEST REPORT

Applicant : ALPHAMETALS CO., LTD.  
Address : 1Ra 310 Sihwa Industrial Complex, 1247-9, Jeongwang-dong,  
Siheung-si, Gyeonggi-do, 429-914 Korea

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Report No. RT13R-S1077-003-E

Date: Mar. 07, 2013

Sample Description : The following submitted sample(s) said to be:-

Name/Type of Product : SOLDER 63Sn37Pb  
Sample ID No. : RT13R-S1077-003  
Manufacturer/Vender : ALPHAMETALS CO., LTD.

Sample received : Mar. 04, 2013  
Testing Date : Mar. 04, 2013 ~ Mar. 07, 2013

Test Type : RoHS wet chemical analysis  
Test Method(s) : Please see the following page(s).  
Test Result(s) : Please see the following page(s).

\* Note 1 : The test results presented in this report relate only to the object tested.

\* Note 2 : This report shall not be reproduced except in full without the written approval of the testing laboratory.

Approved by,

Jade Jang / Lab. Technical Manager

Authorized by,

Bo Park / Lab. General Manager

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# TEST REPORT

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Date: Mar. 07, 2013

Report No. RT13R-S1077-003-E

Sample ID No. : RT13R-S1077-003  
Sample Description : SOLDER 63Sn37Pb

| Test Item   | Unit  | Test Method  | MDL  | Result   |
|---|-------|--|--|----------|
| Cadmium (Cd)  | mg/kg | With reference to IEC 62321 Edition 1.0 : 2008, by acid digestion and determined by ICP-OES                            | 0.5  | N.D.     |
| Lead (Pb)   | mg/kg |  | 5  | 365000   |
| Mercury (Hg)  | mg/kg |  | 2  | N.D.     |
| Hexavalent Chromium (Cr <sup>6+</sup> ) (For metal) | -     | With reference to IEC 62321 Edition 1.0 : 2008, by Spot test   | (Threshold of 1 mg/kg)                             | Negative |
| Hexavalent Chromium (Cr <sup>6+</sup> ) (For metal) | -     | With reference to IEC 62321 Edition 1.0 : 2008, by boiling water extraction and determined by UV-VIS Spectrophotometer | (Threshold of 0.02 mg/kg with 50 cm <sup>2</sup> ) | Negative |

Tested by : Leo Kim, Changho Kim, Jean Kim

- Notes : mg/kg = ppm = parts per million  
mg/kg with 50 cm<sup>2</sup> = milligram per kilogram with 50 square centimeter  
< = Less than  
N.D. = Not detected ( <MDL )  
MDL = Method detection limit  
Positive = A positive test result indicated the presence of Cr(VI) at the time of testing, equal to or greater than threshold of 1 mg/kg for spot test procedures or 0.02 mg/kg for boiling water extraction procedures with a sample surface area of 50 cm<sup>2</sup> used. However, it shall not be interpreted as the Cr(VI) concentration in the coating layer of the sample and should not be used as a method detection limit for this qualitative test.  
Negative = A negative test result indicates above positive observation was not found at the time of testing. When the spot test showed a negative result, the boiling water extraction procedure shall be used to verify the result.

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# TEST REPORT

Page: 3 of 5  
Date: Mar. 07, 2013

Report No. RT13R-S1077-003-E

Sample ID No. : RT13R-S1077-003  
Sample Description : SOLDER 63Sn37Pb

| Test Item                             | Unit  | Test Method  | MDL | Result |
|---------------------------------------|-------|--|-----|--------|
| Polybrominated Biphenyl (PBBs)        |       |  |     |        |
| Monobromobiphenyl                     | mg/kg | With reference to<br>IEC 62321 Edition 1.0 : 2008,<br>by solvent extraction and<br>determined by GC/MS | 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.   |
| Polybrominated Diphenyl Ether (PBDEs) |       |  |     |        |
| Monobromodiphenyl ether               | mg/kg | With reference to<br>IEC 62321 Edition 1.0 : 2008,<br>by solvent extraction and<br>determined by GC/MS | 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.   |

Tested by : Misun Lee

Notes : mg/kg = ppm = parts per million  
< = Less than  
N.D. = Not detected ( <MDL )  
MDL = Method detection limit

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Date: Mar. 07, 2013

Report No. RT13R-S1077-003-E

Sample ID No. : RT13R-S1077-003  
Sample Description : SOLDER 63Sn37Pb

\* View of sample as received;-



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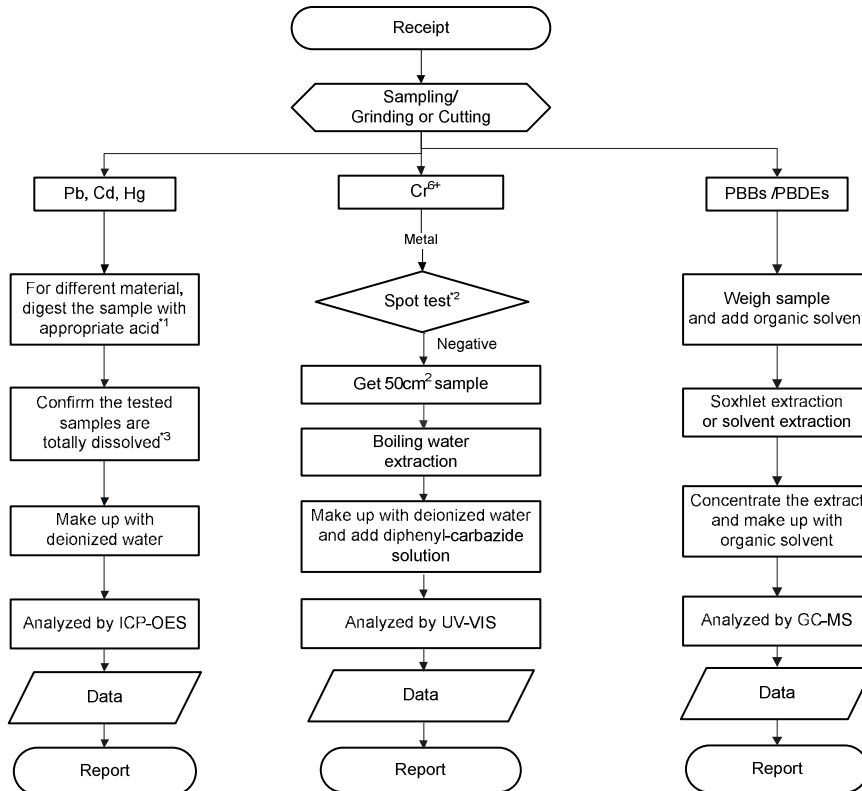
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Sample ID No. : RT13R-S1077-003  
Sample Description : SOLDER 63Sn37Pb

Flow Chart  
(IEC 62321 Edition 1.0 : 2008)



Remarks :

\*1 : List of appropriate acid :

| Material    | Acid added for digestion   |
|-------------|--|
| Polymers    | HNO <sub>3</sub> , HCl, HF, H <sub>2</sub> O <sub>2</sub> , H <sub>3</sub> BO <sub>3</sub> |
| Metals      | HNO <sub>3</sub> , HCl, HF   |
| Electronics | HNO <sub>3</sub> , HCl, H <sub>2</sub> O <sub>2</sub> , HBF <sub>4</sub>                   |

\*2 : If the result of spot test is positive, Chromium (VI) would be determined as detected. No further analysis is required.

\*3 : The samples were dissolved totally by pre-conditioning method according to above flow chart.

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

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