

## TEST REPORT

APPLICANT : Alpha Assembly Solutions Korea Ltd.  
ADDRESS : 1Ra 310 Sihwa Industrial Complex, 40, Okgucheonseo-ro 131beon-gil,  
Siheung-si, Gyeonggi-do, Korea

PAGE: 1 of 5

REPORT NO. RT19R-S0533-001-E

DATE: Feb. 08, 2019

SAMPLE DESCRIPTION : The following submitted sample(s) said to be:-

NAME/TYPE OF PRODUCT : SOLDER 63Sn37Pb  
SAMPLE ID NO. : RT19R-S0533-001  
MANUFACTURER/VENDOR : Alpha Assembly Solutions Korea Ltd.

SAMPLE RECEIVED : Jan. 30, 2019  
TESTING DATE : Jan. 30, 2019 ~ Feb. 08, 2019

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 refer only to the object tested.
- \* Note 2 : This report shall not be reproduced except in full without the written approval of the testing laboratory.
- \* Note 3 : This report is not related to the scope of Korea laboratory accreditation scheme.

Approved by,



Jade Jang / Lab. Technical Manager

Authorized by,



Bo Park / Lab. General Manager



Authenticity check

Intertek Testing Services Korea Ltd.  
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## TEST REPORT

REPORT NO. RT19R-S0533-001-E

SAMPLE ID NO. : RT19R-S0533-001

SAMPLE DESCRIPTION : SOLDER 63Sn37Pb

TEST ITEM	UNIT	TEST METHOD	MDL	RESULT
Cadmium (Cd)	mg/kg	With reference to IEC 62321-5 Edition 1.0 : 2013, by acid digestion and determined by ICP-OES	0.5	N.D.
Lead (Pb)	mg/kg		5	368000
Mercury (Hg)	mg/kg	With reference to IEC 62321-4 Edition 1.0 : 2013, by acid digestion and determined by ICP-OES	2	N.D.
Hexavalent Chromium (Cr <sup>6+</sup> ) (For metal)	μg/cm <sup>2</sup>	With reference to IEC 62321-7-1 Edition 1.0 : 2015, by boiling water extraction and determined by UV-VIS Spectrophotometer	0.10	Negative

Tested by : Jooyeon Lee, Seulgi Park

Notes : mg/kg = ppm = parts per million  
 μg/cm<sup>2</sup> = microgram per square centimeter  
 < = Less than  
 N.D. = Not detected ( <MDL )  
 MDL = Method detection limit

Remarks : Interpretation of Cr<sup>6+</sup> results

Qualitative result	Concentration of Cr <sup>6+</sup> (μg/cm <sup>2</sup> )	Meaning
Negative	< 0.10	The sample coating is considered a non-Cr <sup>6+</sup> based coating.
Inconclusive	0.10 ≤ and ≤ 0.13	Unavoidable coating variation may influence the determination.
Positive	> 0.13	The sample coating is considered to contain Cr <sup>6+</sup> .

- The qualitative results should be determination by the average result of three test results. (If concentration of Cr<sup>6+</sup> is over 0.10μg/cm<sup>2</sup>)
- The above results will be carried out by visual comparison only with the standard.

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## TEST REPORT

REPORT NO. RT19R-S0533-001-E

SAMPLE ID NO. : RT19R-S0533-001

SAMPLE DESCRIPTION : SOLDER 63Sn37Pb

TEST ITEM	UNIT	TEST METHOD	MDL	RESULT
<b>Polybrominated Biphenyl (PBBs)</b>				
Monobromobiphenyl	mg/kg	With reference to IEC 62321-6 Edition 1.0 : 2015, by solvent extraction and 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.
<b>Polybrominated Diphenyl Ether (PBDEs)</b>				
Monobromodiphenyl ether	mg/kg	With reference to IEC 62321-6 Edition 1.0 : 2015, by solvent extraction and 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 : Miseon Lee

Notes : mg/kg = ppm = parts per million  
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## TEST REPORT

PAGE: 4 of 5  
DATE: Feb. 08, 2019

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SAMPLE DESCRIPTION : SOLDER 63Sn37Pb

\* View of sample as received;-



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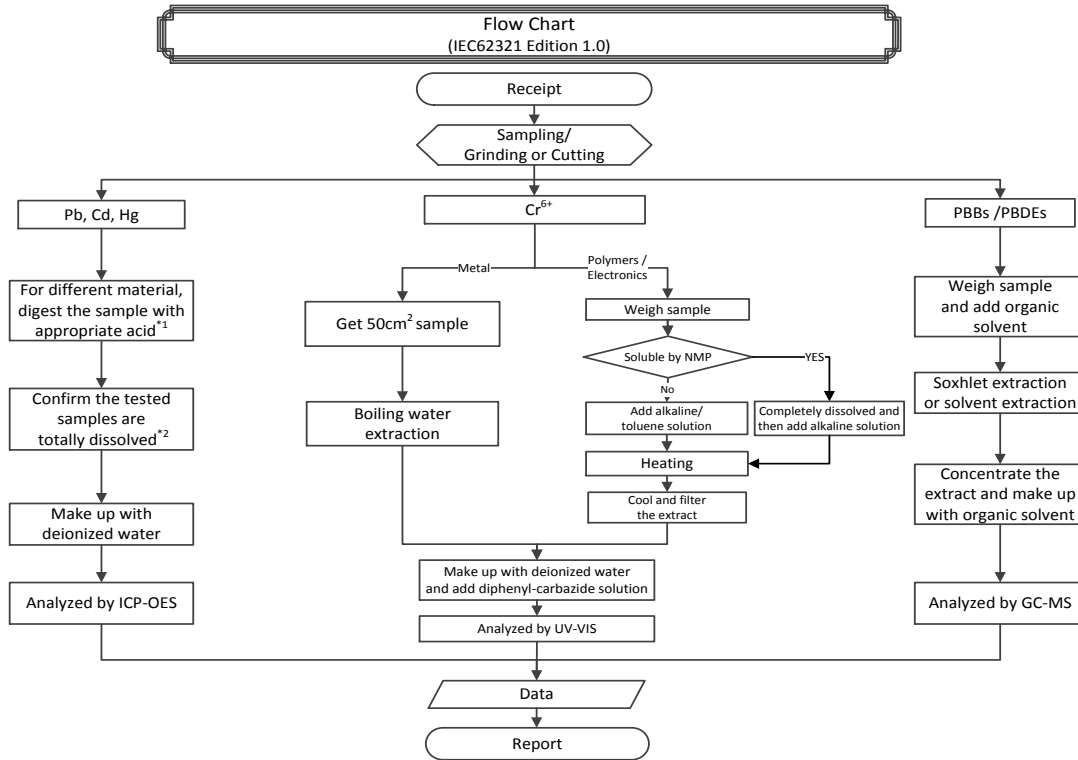
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SAMPLE DESCRIPTION : SOLDER 63Sn37Pb



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

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

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