

POONGSAN CORPORATION94 Sanam-ro, Onsan-eup
Ulju-gun, Ulsan
Korea

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

SGS File No. : AYGU20-07279
Product Name : C5191
Item No./Part No. : Phosphor Bronze
Received Date : 2020. 07. 02
Test Period : 2020. 07. 02 to 2020. 07. 22
Conclusion : Based on the performed tests on selected part of submitted samples, the results of Cadmium, Lead, Mercury, Hexavalent chromium, Polybrominated biphenyls (PBB), Polybrominated diphenyl ethers (PBDE), 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.
Test Results : For further details, please refer to following page(s)

SGS Korea Co., Ltd.
/ LTS Busan Laboratory**Dongju Lee / Technical Manager**

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Test Report No. F690101/LF-CTSAYGU20-07279

Issued Date : 2020. 07. 22

Page 2 of 8

Sample No. : AYGU20-07279.001
Sample Description : C5191
Item No./Part No. : Phospher Bronze
Materials : N/A

Heavy Metals

Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	With reference to IEC 62321-4 : 2013+A1:2017, With reference to IEC 62321-5 : 2013, by ICP-OES	0.5	N.D.
Lead (Pb)	mg/kg	With reference to IEC 62321-4 : 2013+A1:2017, With reference to IEC 62321-5 : 2013, by ICP-OES	5	29.1
Mercury (Hg)	mg/kg	With reference to IEC 62321-4 : 2013+A1:2017, With reference to IEC 62321-5 : 2013, by ICP-OES	2	N.D.
Hexavalent Chromium (Cr VI) *	µg/cm ²	With reference to IEC 62321-7-1 : 2015, by UV-Vis	0.1	N.D.
Antimony (Sb)	mg/kg	With reference to EPA 3052 : 1996,With reference to EPA 6010B : 1996, by ICP-OES	10	N.D.
Beryllium (Be)	mg/kg	With reference to EPA 3052 : 1996,With reference to EPA 6010B : 1996, by ICP-OES	5	N.D.

Flame Retardants-PBBs/PBDEs

Test Items	Unit	Test Method	MDL	Results
Monobromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Dibromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Tribromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Tetrabromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Pentabromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Hexabromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Heptabromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Octabromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Nonabromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Decabromobiphenyl	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Monobromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Dibromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Tribromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Tetrabromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Pentabromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Hexabromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Heptabromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Octabromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Nonabromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.
Decabromodiphenyl ether	mg/kg	With reference to IEC 62321-6 : 2015, by GC-MS	5	N.D.

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CBQP-7081-F01 (01)

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Member of the SGS Group (Société Générale de Surveillance)

Sample No. : AYGU20-07279.001
Sample Description : C5191
Item No./Part No. : Phospher Bronze
Materials : N/A

Phthalates

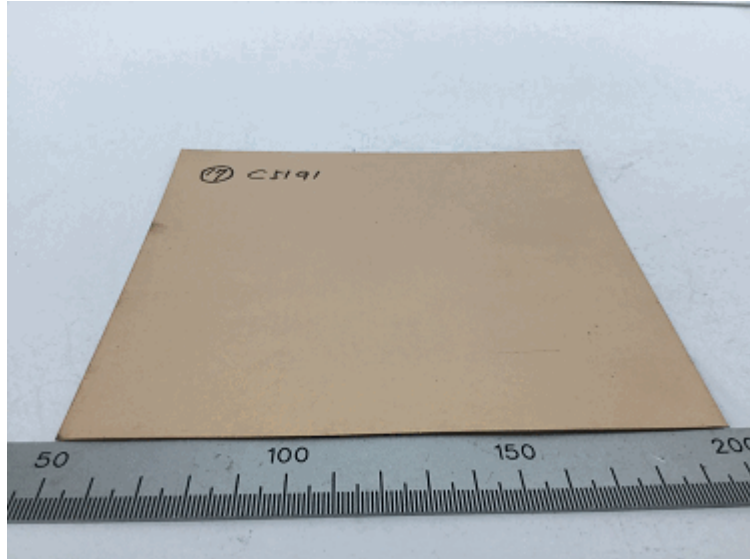
Test Items	Unit	Test Method	MDL	Results
Di-(2-ethylhexyl) phthalate (DEHP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
Di-butyl phthalate (DBP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
Benzyl butyl phthalate (BBP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.
Di-isobutyl phthalate (DIBP)	mg/kg	With reference to IEC 62321-8 : 2017, by GC-MS	50	N.D.

Halogen Contents

Test Items	Unit	Test Method	MDL	Results
Bromine(Br)	mg/kg	With reference to ASTM D 7359-14a : 2014 by IC	30	N.D.
Chlorine(Cl)	mg/kg	With reference to ASTM D 7359-14a : 2014 by IC	30	N.D.
Fluorine(F)	mg/kg	With reference to ASTM D 7359-14a : 2014 by IC	30	N.D.
Iodine(I)	mg/kg	With reference to ASTM D 7359-14a : 2014 by IC	50	N.D.

- NOTE:
- (1) N.D. = Not detected.(<MDL)
 - (2) mg/kg = ppm
 - (3) µg/kg = ppb
 - (4) MDL = Method Detection Limit
 - (5) - = No regulation
 - (6) Negative = Undetectable / Positive = Detectable
 - (7) ** = Qualitative analysis (No Unit)
 - (8) * = a. The sample is positive for CrVI if the CrVI concentration is greater than 0.13 ug/cm². The sample coating is considered to contain CrVI.
 b. The sample is negative for CrVI if CrVI is n.d. (concentration less than 0.10 ug/cm²). The coating is considered a non-CrVI based coating.
 c. The result between 0.10 ug/cm² and 0.13 ug/cm² is considered to be inconclusive - unavoidable coating variations may influence the determination.
 - (9) The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
 This test report is not related to Korea Laboratory Accreditation Scheme .

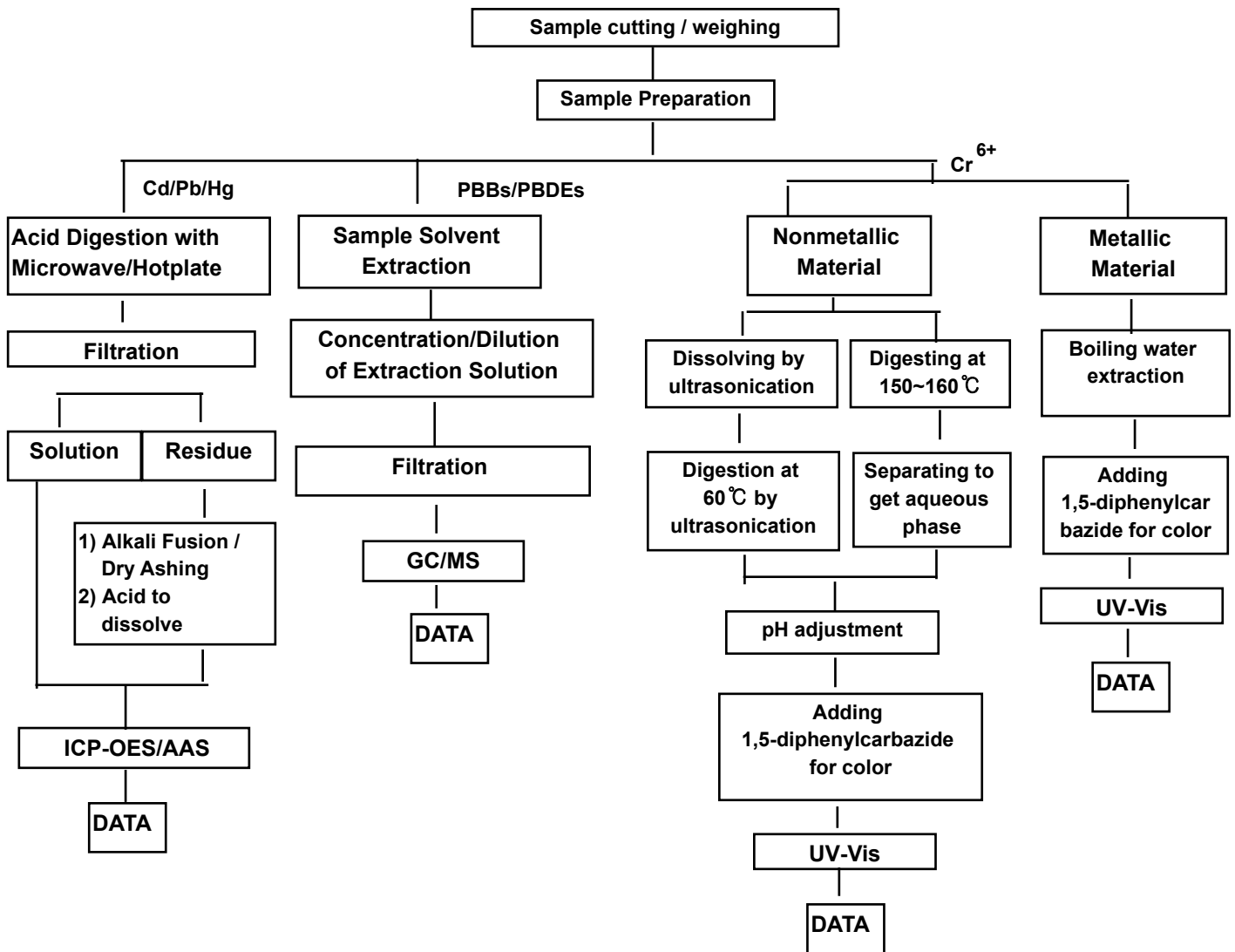
Picture of Sample as Received:



AYGU20-07279.001

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Testing Flow Chart for RoHS:Cd/Pb/Hg/Cr⁶⁺ /PBBs&PBDEs Testing



The samples were dissolved totally at the acid digestion step of the above flow chart for Cd,Pb,Hg

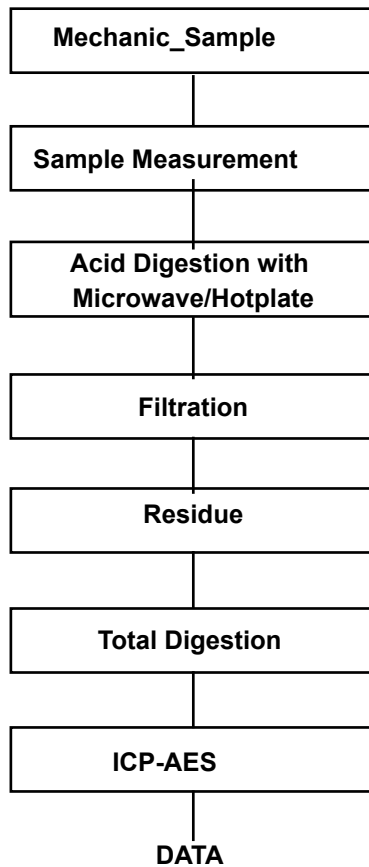
- Technician : Gihwan Kim/Choah Jeong/Taehee Kang
- Supervisor : Dongju Lee

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Flow Chart for Inorganic Elements Testing

Inorganic Elements



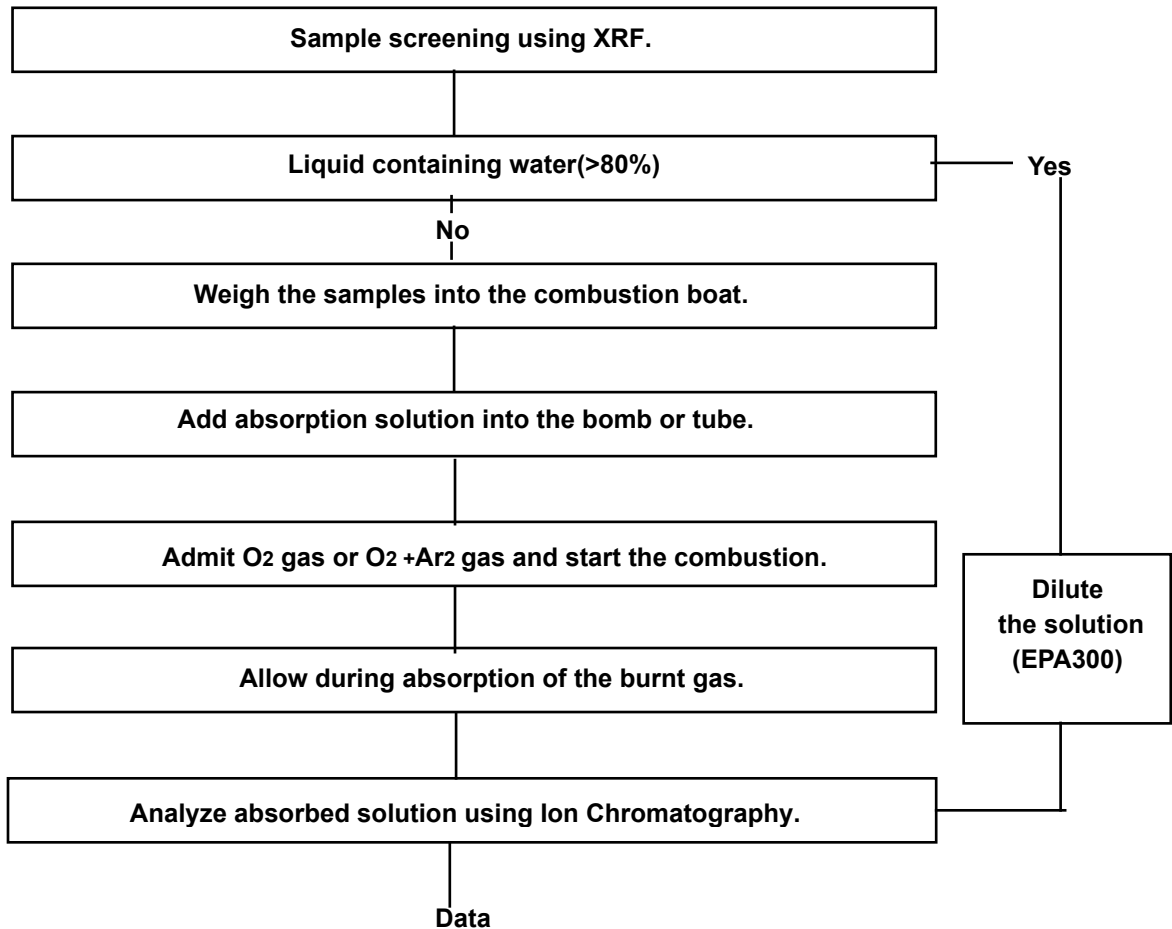
Major Inorganic Heavy Metals	Antimony(Sb) , Beryllium(Be) , Phosphorus(P) , Arsenic(As) etc.
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- Technician : Gihwan Kim
- Supervisor : Dongju Lee

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Flow Chart for Halogen Test

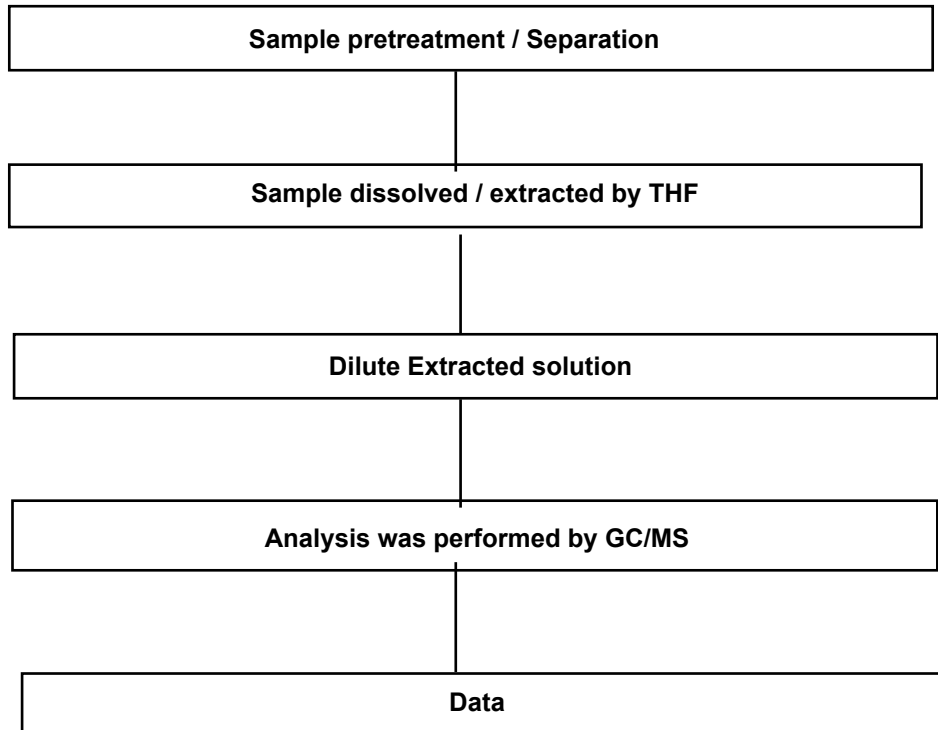


- Technician : Gihwan Kim
- Supervisor : Dongju Lee

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Flow Chart for Phthalate Test



- Technician : Yukyung Park
- Supervisor : Dongju Lee

*** End of Report ***

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