

TEST REPORT

APPLICANT : Samhwa Non-Ferrous Metal Ind. Co., Ltd.
ADDRESS : 156, Ojanggol-gil, Gunbuk-myeon, Haman-gun,
Gyeongsangnam-do, Korea

PAGE: 1 of 11

REPORT NO. RT23R-S0296-E

DATE: Jan. 17, 2023

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

NAME/TYPE OF PRODUCT : Tin Ball
NAME OF MATERIAL : Sn
SAMPLE ID NO. : RT23R-S0296
MANUFACTURER/VENDOR : Samhwa Non-Ferrous Metal Ind. Co., Ltd.

SAMPLE RECEIVED : Jan. 12, 2023
TESTING DATE : Jan. 12, 2023 ~ Jan. 17, 2023

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.

Approved by,



Jade Jang / Lab. Technical Manager

Authorized by,



Bo Park / Lab. General Manager

Intertek Testing Services Korea Ltd.

Seoul Office: Tel : 02-6090-9500 Fax : 02-3409-0025 Web Site : intertek.co.kr

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Ulsan Lab. Address : 34, Yongam-gil, Chongryang-myeon, Ulju-gun, Ulsan 44989 Korea



TEST REPORT

REPORT NO. RT23R-S0296-E

PAGE: 2 of 11

DATE: Jan. 17, 2023

SAMPLE ID NO. : RT23R-S0296

SAMPLE DESCRIPTION : AI 6063

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	258
Mercury (Hg)	mg/kg	With reference to IEC 62321-4 : 2013/AMD1 : 2017, by acid digestion and determined by ICP-OES	2	N.D.
Hexavalent Chromium (Cr ⁶⁺) (For metal)	μg/cm ²	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, Chano Kim

Notes : mg/kg = ppm = parts per million
μg/cm² = microgram per square centimeter
< = Less than
N.D. = Not detected (<MDL)
MDL = Method detection limit

Remarks : Interpretation of Cr⁶⁺ results

Qualitative result	Concentration of Cr ⁶⁺ (μg/cm ²)	Meaning
Negative	< 0.10	The sample coating is considered a non-Cr ⁶⁺ 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 ⁶⁺ .

1. The qualitative results should be determination by the average result of three test results.
(If concentration of Cr⁶⁺ is over 0.10μg/cm²)
2. The above results will be carried out by visual comparison only with the standard.

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TEST REPORT

PAGE: 3 of 11
DATE: Jan. 17, 2023

REPORT NO. RT23R-S0296-E

SAMPLE ID NO. : RT23R-S0296

SAMPLE DESCRIPTION : AI 6063

TEST ITEM	UNIT	TEST METHOD	MDL	RESULT
Polybrominated Biphenyl (PBBs)				
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.
Polybrominated Diphenyl Ether (PBDEs)				
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 : Hayan Park

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TEST REPORT

PAGE: 4 of 11
DATE: Jan. 17, 2023

REPORT NO. RT23R-S0296-E

SAMPLE ID NO. : RT23R-S0296

SAMPLE DESCRIPTION : AI 6063

TEST ITEM	UNIT	TEST METHOD	MDL	RESULT
Bromine (Br)	mg/kg	With reference to EN 14582, by oxygen combustion with bomb and determined by IC	30	N.D.
Chlorine (Cl)	mg/kg	With reference to EN 14582, by oxygen combustion with bomb and determined by IC	30	N.D.
Beryllium (Be)	mg/kg	With reference to US EPA 3052, by acid digestion and determined by ICP-OES	2	N.D.
Antimony (Sb)	mg/kg	With reference to US EPA 3052, by acid digestion and determined by ICP-OES	2	53
Medium-chain chlorinated paraffin (MCCP)	mg/kg	With reference to US EPA 3540C, by solvent extraction and determined by LC/MS/MS and/or GC/ECD	100	N.D.

Tested by : Chano Kim, Jooyeon Lee, Hayan Park

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PAGE: 5 of 11
DATE: Jan. 17, 2023

REPORT NO. RT23R-S0296-E

SAMPLE ID NO. : RT23R-S0296

SAMPLE DESCRIPTION : AI 6063

TEST ITEM	CAS NO.	UNIT	TEST METHOD	MDL	RESULT
Dibutyl phthalate (DBP)	84-74-2	mg/kg	With reference to IEC 62321-8 Edition 1.0 : 2017, by solvent extraction and determined by GC/MS	50	N.D.
Di(2-ethylhexyl) phthalate (DEHP)	117-81-7	mg/kg		50	N.D.
Di-n-octyl phthalate (DNOP)	117-84-0	mg/kg		50	N.D.
Diisononyl phthalate (DINP)	28553-12-0 68515-48-0	mg/kg		100	N.D.
Diisodecyl phthalate (DIDP)	26761-40-0 68515-49-1	mg/kg		100	N.D.
Benzyl butyl phthalate (BBP)	85-68-7	mg/kg		50	N.D.
Diisobutyl phthalate (DIBP)	84-69-5	mg/kg		50	N.D.
Di-n-hexyl phthalate (DNHP)	84-75-3	mg/kg		50	N.D.

Tested by : Hayan Park

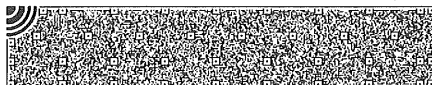
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TEST REPORT

PAGE: 6 of 11

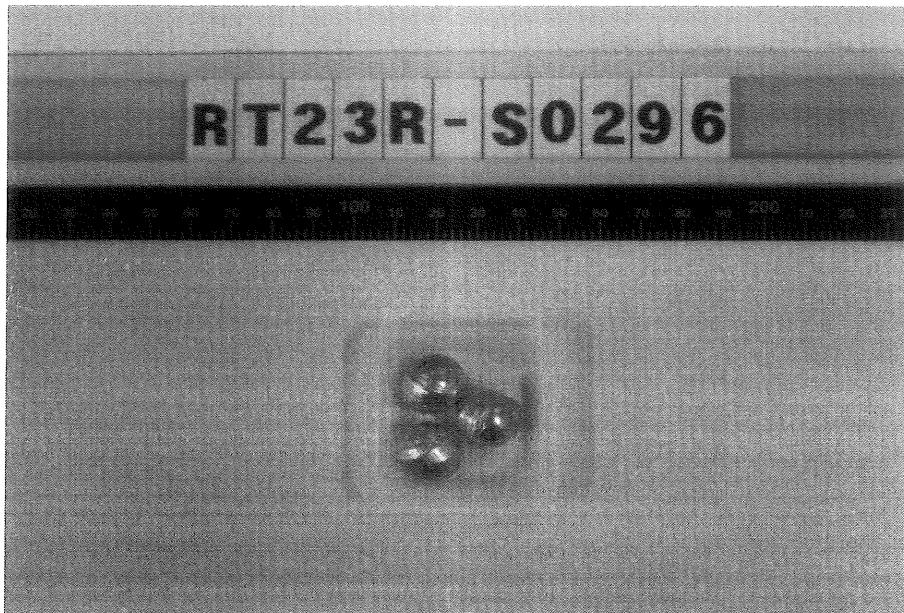
DATE: Jan. 17, 2023

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SAMPLE DESCRIPTION : AI 6063

* View of sample as received;-

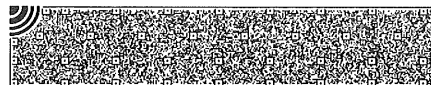
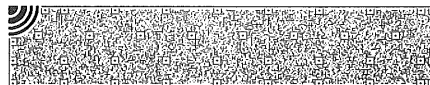
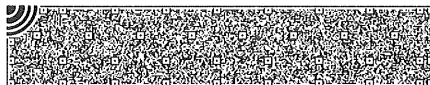


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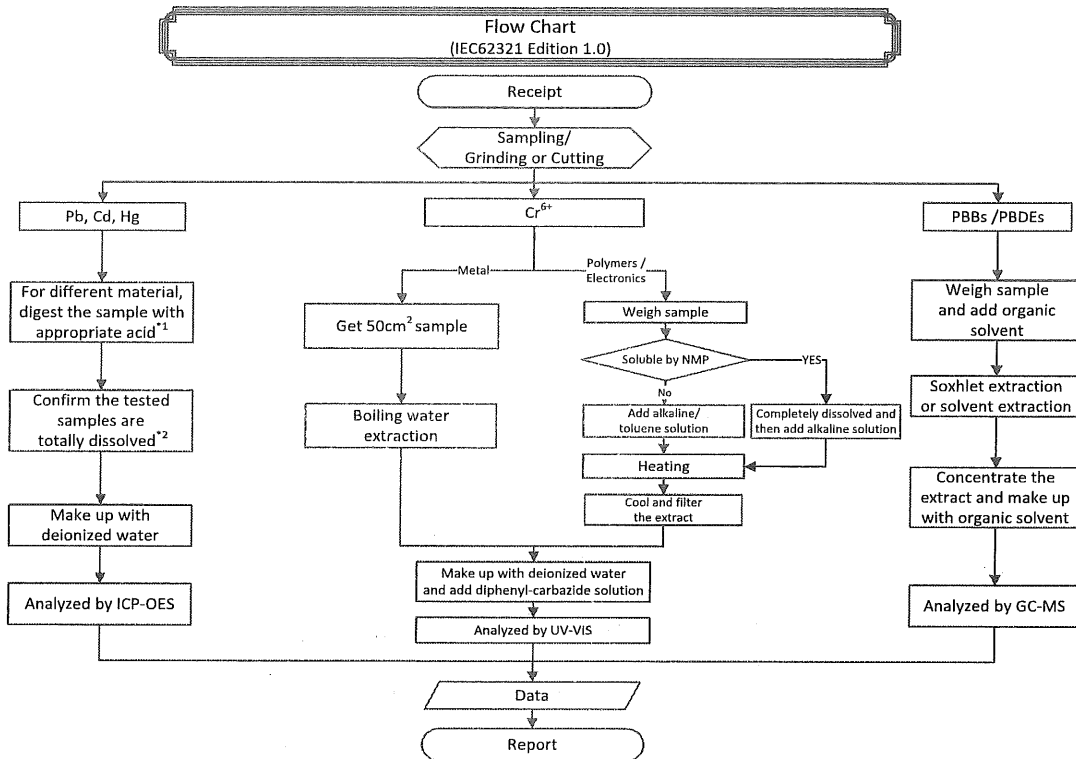
REPORT NO. RT23R-S0296-E

PAGE: 7 of 11

DATE: Jan. 17, 2023

SAMPLE ID NO. : RT23R-S0296

SAMPLE DESCRIPTION : AI 6063



Remarks :

*1 : List of appropriate acid :

Material	Acid added for digestion
Polymers	HNO ₃ , HCl, HF, H ₂ O ₂ , H ₃ BO ₃
Metals	HNO ₃ , HCl, HF
Electronics	HNO ₃ , HCl, H ₂ O ₂ , HBF ₄

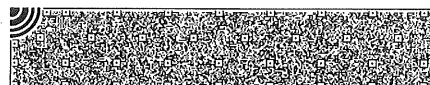
*2 : The samples were dissolved totally by pre-conditioning method according to above flow chart.

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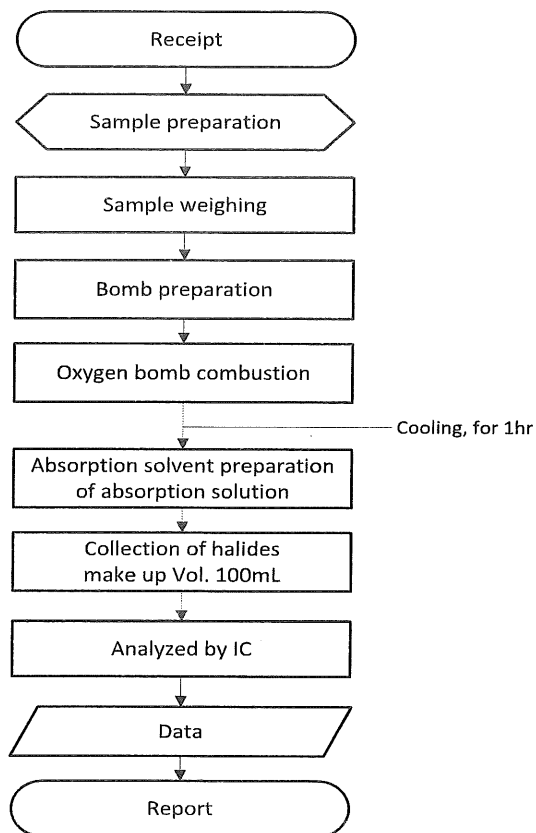
PAGE: 8 of 11

DATE: Jan. 17, 2023

SAMPLE ID NO. : RT23R-S0296

SAMPLE DESCRIPTION : AI 6063

Flow Chart (EN14582)



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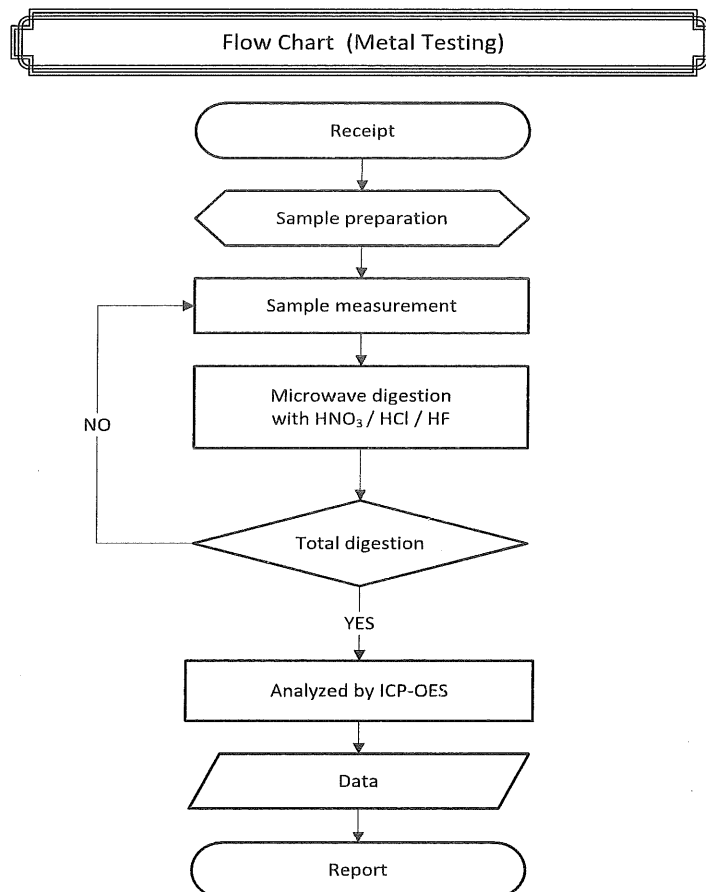
TEST REPORT

PAGE: 9 of 11
DATE: Jan. 17, 2023

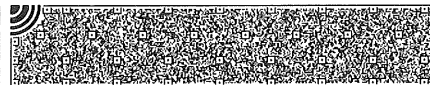
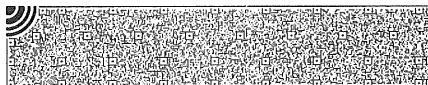
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SAMPLE ID NO. : RT23R-S0296

SAMPLE DESCRIPTION : AI 6063



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



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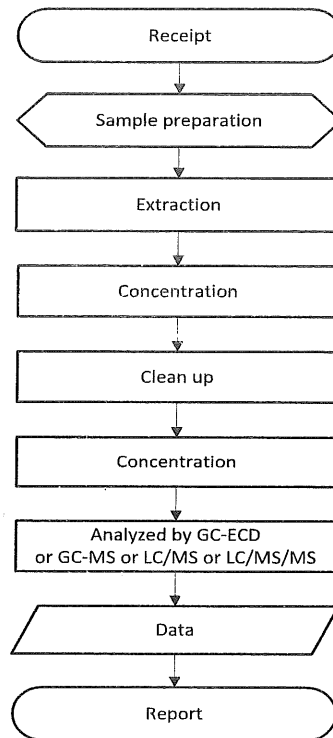
REPORT NO. RT23R-S0296-E

PAGE: 10 of 11
DATE: Jan. 17, 2023

SAMPLE ID NO. : RT23R-S0296

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Flow Chart (EPA 3540C)



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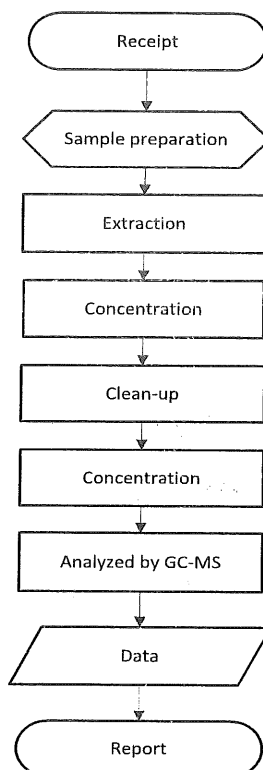
PAGE: 11 of 11

DATE: Jan. 17, 2023

SAMPLE ID NO. : RT23R-S0296

SAMPLE DESCRIPTION : AI 6063

Flow Chart (Phthalates)



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

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