Physical Properties of Metal

Element	Element Name	Atomic Number	Atomic Wt.	Specific Gravity (20℃)	Melting Point (℃)	Boiling Point (℃)	Specific Heat (cal/g/℃)	Thermal Conductivity (cal/㎠·sec·℃)
Ag	Silver	47	107.88	10.497	960.5	2210	0.056(0℃)	1.0(0℃)
Al	Aluminium	13	26.98	2.699	660.2	2060	0.223	0.53
As	Arsenic	33	74.91	5.73	814	610	0.082	-
Au	Gold	79	196.96	19.32	1063.0	2970	0.031	0.71
B	Boron	5	10.82	2.3	2300±300	2550	0.309	-
Ba	Barium	56	137.34	3.78	704±20	1640	0.068	-
Be	Beryllium	4	9.013	1.84	1278±5	1500	0.52	0.39
Bi	Bismuth	83	209	9.8	271.3	1420	0.034	0.0194
C	Carbon	6	12.011	2.22	3700±100	4830	0.165	0.057
Ca	Calcium	20	40.08	1.55	850±20	1440	0.149	0.30
Nb	Niobium	41	92.91	8.569	2415	>3300	0.065(0℃)	-
Cd	Cadmium	48	112.41	8.65	320.9	767	0.055	0.222
Ce	Cerium	58	140.13	6.9	600±50	1400	0.042	-
Co	Cobalt	27	58.94	8.9	1495	2900	0.099	0.165
Cr	Chromium	24	52.01	7.09	1890	2500	0.11	0.16
Cs	Cesium	55	132.91	1.9	28±2	690	0.052	-
Cu	Copper	29	63.54	8.96	1083.0	2600	0.092	0.94
Fe	Iron	26	55.85	7.871	1539±3	2740	0.1107	0.18
Ga	Gallium	31	69.72	5.91	29.78	2070	0.079	-
Ge	Germanium	32	72.60	5.36	958±10	2700	0.073	-
Hg	Mercury	80	200.61	13.55	-38.87	357	0.033	0.020
In	Indium	49	114.76	7.31	156.4	1450	0.057	0.057
Ir	Iridium	77	193.5	22.5	2454±3	5300	0.031	0.14
K	Potassium	19	39.096	0.86	63.7	770	0.177	0.24
La	Lanthanum	57	138.92	6.15	826±5	1800	0.045	-
Li	Lithium	3	6.940	0.531	186±5	>1370	0.79	0.17
Mg	Magnesium	12	24.32	1.743	650	1110	0.25	0.38
Mn	Manganese	25	54.93	7.4	1245±10	2150	0.115	-
Mo	Molybdenum	42	95.95	10.218	2625±50	3700	0.061	0.35
Na	Sodium	11	22.997	0.971	97.9	892	0.295	0.30
Ni	Nickel	28	58.69	8.85	1455	2730	0.112	0.14
Os	Osmium	76	190.2	22.5	2700±200	5500	0.031	-
P	Phosphorus	15	30.975	1.82	44.1	280	0.177	-
Pb	Lead	82	207.21	11.36	327.43	1740	0.031	0.083
Pt	Platinum	78	195.23	21.45	1773.5	4410	0.032	0.17
Rb	Rubidium	37	85.48	1.53	39±1	680	0.08	-
Rh	Rhodium	45	102.91	12.44	1966±3	4500	0.059	0.21
Ru	Rutheninm	44	101.7	12.2	2500±100	4900	0.057	-
S	Sulfur	16	32.066	2.07	119.0	444	0.175	-
Sb	Antimony	51	121.76	6.62	630.5	1440	0.049	0.042
Se	Selenium	34	78.96	4.81	220±5	680	0.084	-
Si	Silicon	14	28.09	2.33	1414	2300	0.162	0.20
Sn	Tin	50	118.70	7.298	231.9	2270	0.054	0.16
Sr	Strontium	38	87.63	2.6	770±10	1380	0.176	-
Ta	Tantalum	73	180.88	16.654	2996±50	>4300	0.036	0.13
Te	Tellurium	52	127.61	6.235	450±10	1390	0.047	0.014
Th	Thorium	90	232.12	11.5	1840±30	>3000	0.034	-
Ti	Titanium	22	47.90	4.54	1730	>3000	0.126	-
U	Uranium	92	233.07	18.7	1133±2	-	0.028	0.064
V	Vanadium	23	50.95	5.82	1725±50	3460	0.12	-
W	Tungsten	74	183.92	19.262	3410±20	5930	0.032	0.48
Zn	Zinc	30	65.38	7.133	419.46	906	0.0915	0.27
Zr	Zirconium	40	91.22	6.50	1830±40	>2900	0.066	-

SAMHWA NON-FERROUS METAL IND. Co., Ltd.

Head Office & Ansan Factory

Address: 147, Beomjigi-ro, Danwon-gu, Ansan-si, Gyeonggi-do, 425-852 R.O.KOREA

Tel: 82-31-491-2161, 310-0700(Rep.) Fax: 82-31-310-0799

Haman Factory

Address: 156, Ojanggol-gil, Gunbuk-myeon, Haman-gun, Gyeongsangnam-do, 637-821 R.O.KOREA

Tel: 82-55-585-0421 Fax: 82-55-585-0420

www.zinc.co.kr

The name of new technology, SAMHWA

FOR CHIP FOR SHIP

SAMHWA NON-FERROUS METAL IND. Co., Ltd.

Company History

1978	06	Established Samhwa Non-Ferrous Metals Ind. Co., Ltd.
	11	Constructed Korea's First automated manufacturing solder facillities
1984	11	Finished construction of Ansan national industrial complex (Started producing Zinc Wire)
1988	11	Constructed production facillities for Aluminium extrusion products
1997	10	Finished construction of Haman factory in Gyeongnam province
1999	10	Awarded President's Commendation
2001	11	Awarded the Order of Industrial Service Medal (New Technology)
2002	10	Certified ISO9001:2000/KSA 9001:2000 quality management system
2005	06	Certified ISO14001:2004 environmental management system
2006	11	Awarded One thousand million Export Tower by the President of Korea
2009	09	Certified as KIBO A+ Member by Korea Technology Finance Corporation
2012	04	Certified as the venture company by Korea Technology Finance Corporation Technology Fund
2013	09	Constructed production facillities for Al and Al Alloy Wire

Subsidiaries

Any Metal | Two M | J&

Fire and Metal

The two special gifts God granted mankind

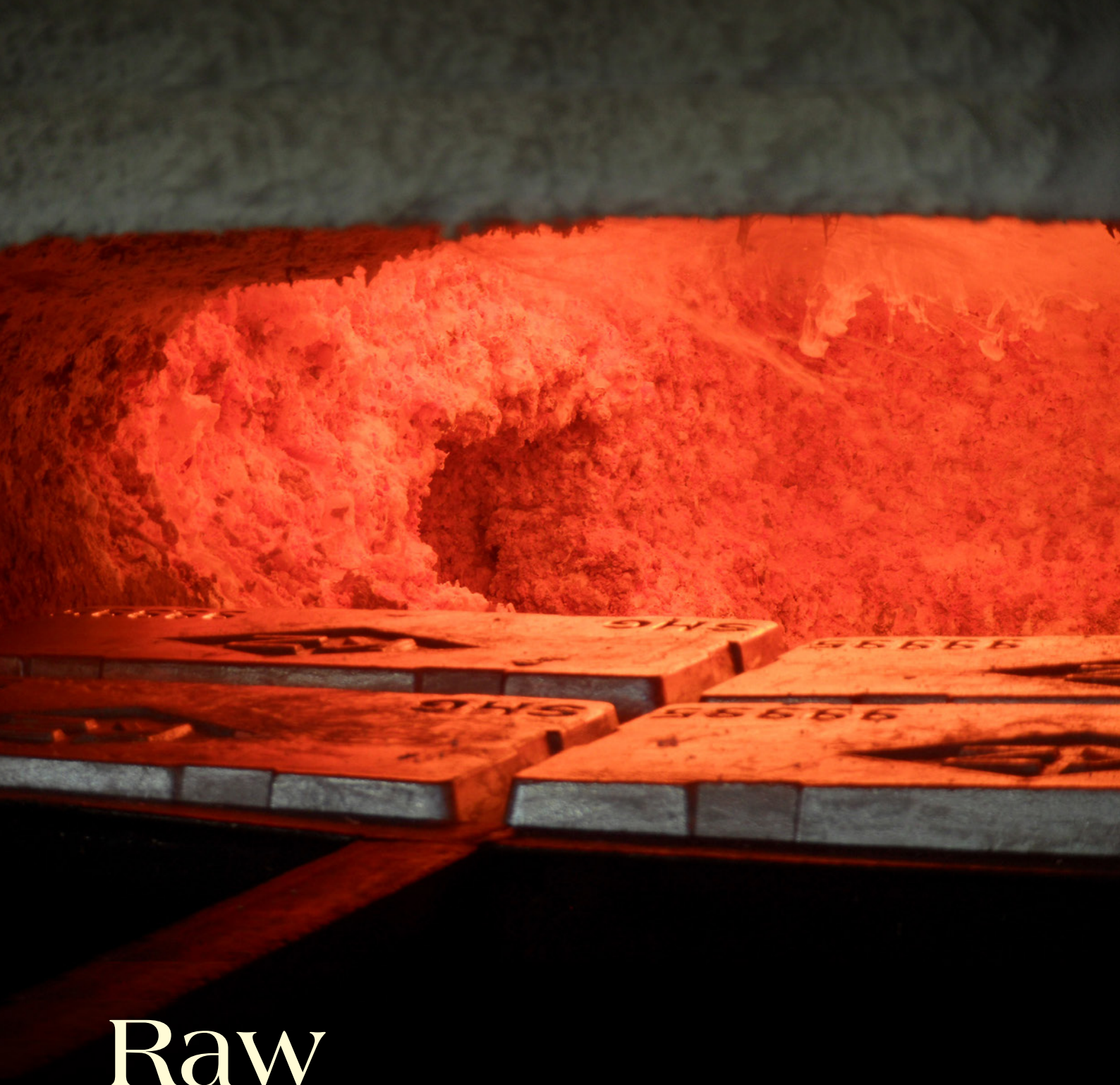
As those who have possessed metal have gained power throughout history, we wish our customers to play an important role in the global market with our expertise in non-ferrous metals.

Head Office & Ansan Factory


Haman Office


Haman 3rd Factory


Haman Office & 2nd Factory

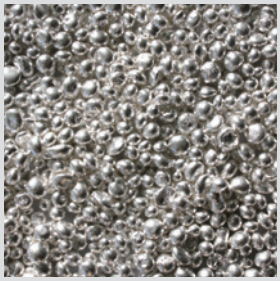


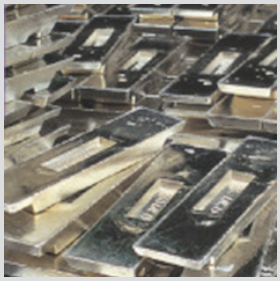
Raw materials

SAMHWA'S exclusive products are
made by using special high grade raw materials.

Raw materials

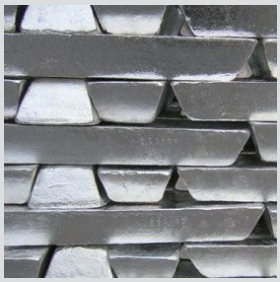

Zinc Ingot


Silver Granules


Tin Ingot


Germanium Ingot


Aluminium Ingot


Magnesium Ingot

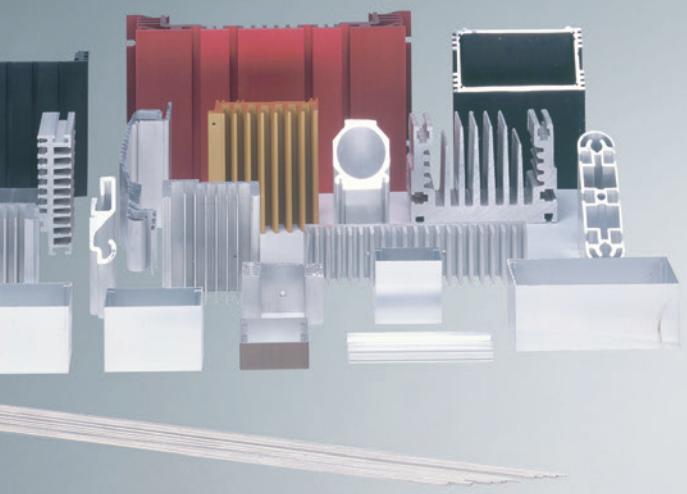

Copper Chip


Silicon Ingot

Since 1978, Quality has been the company's top priority.

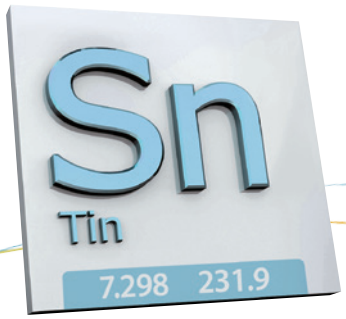
When it comes to quality, our employees have fulfilled their duties with utmost sincerity.

Products



For over 35 years, we have continuously developed and produced an extensive range of zinc, tin, aluminium and alloy of non-ferrous metals; from BGA solder spheres for semi-conductors to cathodic protection zinc for ship with capacity of tens of thousands of tons.

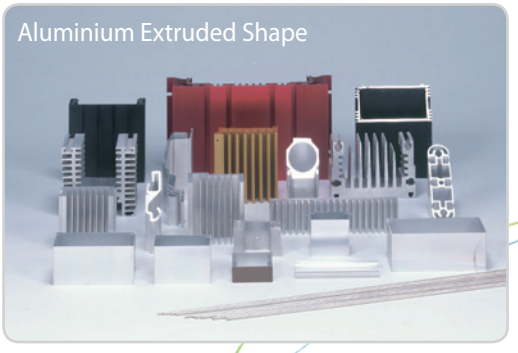
Resin Flux Cored Solder



Lead Free Solder Bar / Solder Bar

Tin Cone & Ball

Aluminium Extruded Shape



Aluminium Wire

Aluminium Cone & Ball

Zinc Wire, Ball, Bar, Rod, Anode

Zinc Wire

Samhwa prides itself on being a rising global leader

in high-tech manufacturing systems, product technology, and sufficient manufacturing capacity.

Cathodic Protection Zinc

Tin-Zinc Alloy Wire

Zinc Alloy

Galfan & Galvalume Bar

Zinc-Aluminium Alloy Wire

Zinc Wire

Product Standard

	Chemical Composition & Impurities Allowance (%)								Physical Properties		
	Zn	Pb	Fe	Cd	Al	Cu	Sn	Permitted Total	Melting Point(℃)	Tensile Strength (Kgf/mm^2)	Elongation(%)
Pure Zinc	99.99 Min	0.003 Max	0.003 Max	0.003 Max	0.005 Max	0.002 Max	0.001 Max	0.01	419	10~12	40 Min
sHR Zinc	99.98 Min	0.005	0.003 Max	0.005 Max	-	0.002 Max	0.001 Max	0.02	419	11~13	30 Min

** sHR Zinc : Symbol of High Strength and High Resistant

Tin-Zinc Wire

Product Standard

	Chemical Composition & Impurities Allowance (%)				Physical Properties	
	Sn	Zn	Sb	Cu	Density(g/cm^3)	Melting Interval(℃)
TZ80185	80±1.0	Rem	1±0.2	0.5±0.2	~ 7.27	200 ~ 262
TZ7030	70±1.0		-	-	~ 7.27	198 ~ 327
TZ6040	60±1.0		-	-	~ 7.26	198 ~ 348
TZ5050	50±1.0		-	-	~ 7.24	198 ~ 360
TZ4060	40±1.0		-	-	~ 7.23	198 ~ 365
S-8 Bar	82±1.0		3±1.0	-	~ 7.26	200 ~246

Zinc - Al Wire

Product Standard

	Chemical Composition & Impurities Allowance (%)							Physical Properties	
	Zn	Al	Pb	Fe	Cd	Cu	Sn	Density (g/cm^3)	Melting Interval(℃)
ZnAl5	Rem	5±0.5	0.005 Max	0.05 Max	0.005 Max	0.01 Max	0.001 Max	6.7	382 ~ 387
ZnAl15		15±1.0						5.73	382 ~ 450

Al Wire

Product Standard

	Chemical Composition & Impurities Allowance (%)								
	Al	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti
A1350	99.8 Min	0.10 Max	0.40 Max	0.05 Max	0.01 Max	-	0.01 Max	0.05 Max	-
A1070	99.7 Min	0.20 Max	0.25 Max	0.03 Max	0.03 Max	0.03 Max	-	0.07 Max	0.03 Max
A1100	99.0 Min	0.95 : Si+Fe Max		0.20 Max	0.05 Max	-	-	0.10 Max	-

C.P.Z.

Product Standard

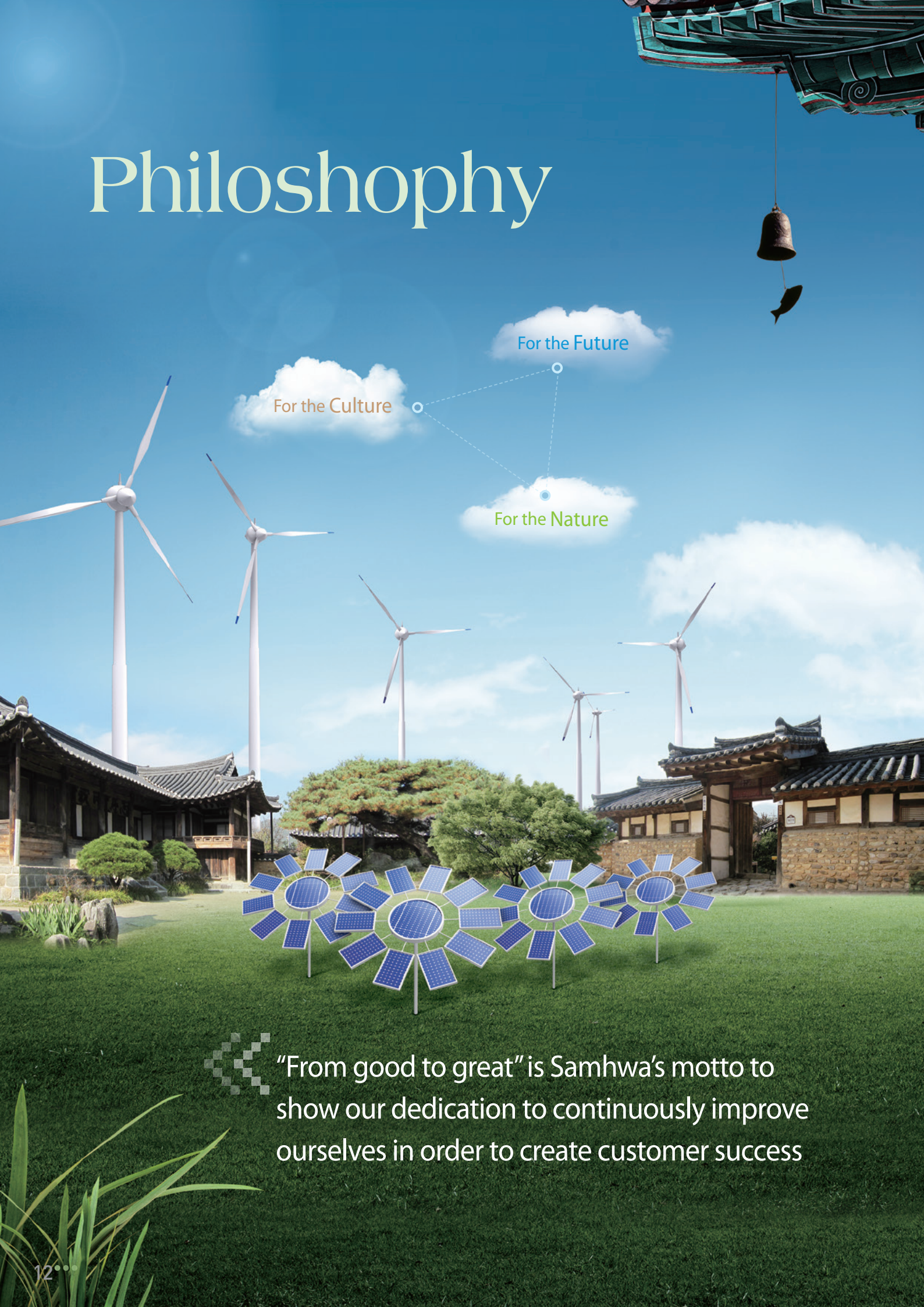
	Chemical Composition(%)					Electrc chemical Properties		
	Zn	Al	Cd	Bi	Mg	Effa (%)	Effective Electricity (A·hr/g)	Final Anodic Potential (Vsce,mV)
Cd free Zn-Al-Bi-Mg	Rem	0.05~0.20	-	0.1~0.50	0.05~0.10	99.5	0.8182	-1057

Solder Bar & Wire

Product Standard

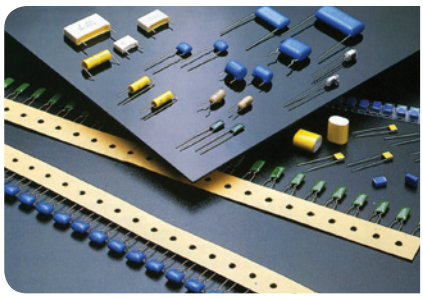
	Chemical Composition & Impurities Allowance (%)											
	Sn	Pb	Ag	Sb	Cu	Bi	Zn	Fe	Al	As	Cd	Solidus Temp. (℃)	Liquidus Temp. (℃)
S63E	62.5~63.5	Rem	-	0.05 max	0.05 max	0.05 max	0.001 max	0.02 max	0.001 max	0.03 max	0.002 max	183	183
S60A	59~61	Rem	-	0.12 max	0.05 max	0.1 max	0.002 max	0.02 max	0.002 max	0.03 max	0.002 Max	183	190
S96.5Ag3Cu0.5A	Rem	0.05 max	2.8 to 3.2	0.1 max	0.3 To 0.7	0.1 max	0.001 max	0.02 max	0.001 max	0.03 max	0.002 max	217	220
S99Cu0.5Bi0.5A	Rem	0.05 max	-	0.1 max	0.3 to 0.7	0.3 To 0.7	0.001 max	0.02 max	0.001 max	0.03 max	0.002 max	219	227

Philoshophy

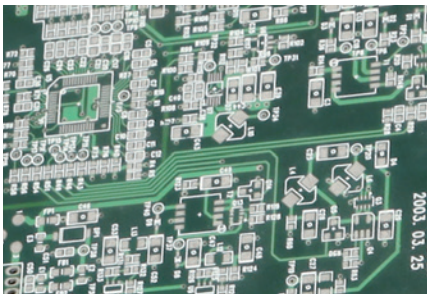


"From good to great" is Samhwa's motto to show our dedication to continuously improve ourselves in order to create customer success

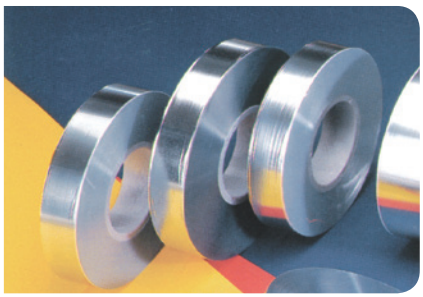
To make 1kg of products, we pour out 1kg of our soul.



Zinc & Tin Zinc Alloy Wire
for Metal Film Capacitors

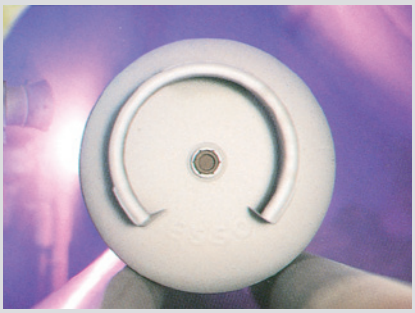


Solder Bar & Wire, Lead Free Solder
for P.C.B



Zinc Bar for Metalized film

Zinc &
Zinc Alloy Wire
for Anti-Corrosion



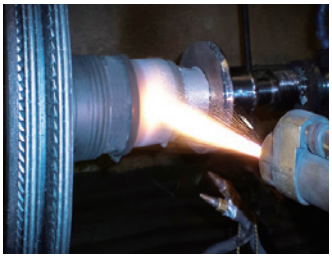
Zinc Wire for
LP Gas Cylinder

Zinc Wire for Al Tube

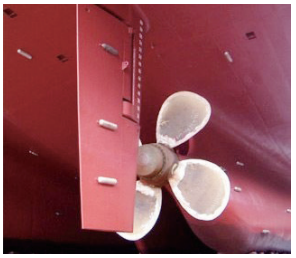
White Metal for Marine Bearing

Zinc Ball for Tire Steel Code

Zinc Wire for Reefer
Container



Zinc & Zinc Alloy Wire
for Thermal Spraying



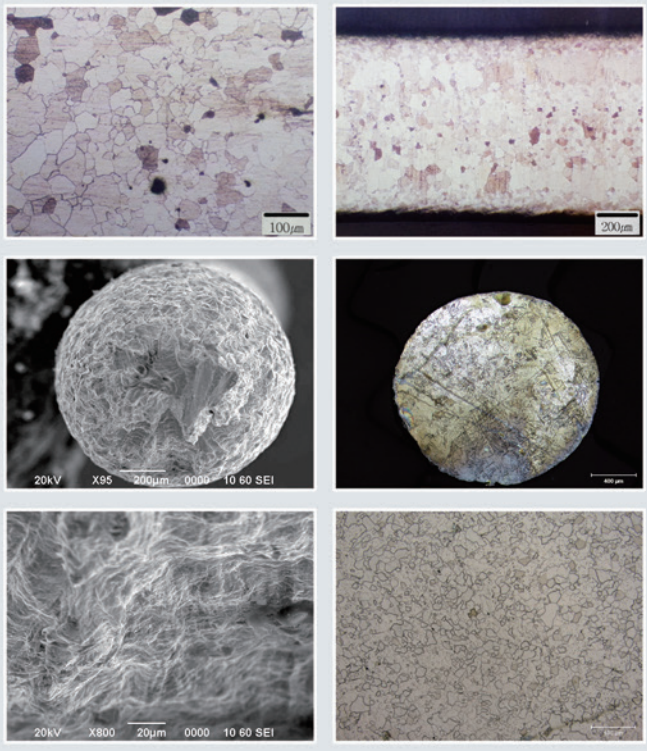
Cathodic Protection Zinc
for Anti Corrosion

Tin & Zinc Ball
for Tin Plating and E.G.S.

Promise

We promise to be a reliable partner for customer success by utilizing over 35 years of experience in 'Quality, Delivery, Price and Technical support'

Metallographic Microstructures



Automatic Melting Furnace

Metallurgical Microscope

Vickers Hardness Tester

Hot Plate

Optical Emission Spectrometer

Microbalance

Lot control from raw materials to finished products

Optical Emission Spectrometer

Tensil strength Tester

Rockwell Hardness Tester