SHENMAO SOLDER
Pb-free Material Edition

Lead Free Bar Solder

- All alloy composition were to conform to SONY Green Partner and comply RoHS requirement

Item / Product Code	Alloy Composition	Melting Point (°C)	Gravity	Strength (kgf/mm)	Elongation(%)
PF601-B	Sn/Ag2.5/Cu0.5	220	7.40	5.30	57
PF603-B	Sn/Ag3.5	221	7.36	4.18	58
PF604-B	Sn/Cu0.7	227	7.32	3.80	50
*PF606-B	Sn/Ag3.0/Cu0.5/X	217-219	7.40	5.30	47
*PF607-B	Sn/Ag3.5/Cu0.7/X	217-219	7.42	5.34	48
*PF608-B	Sn/Ag3.9/Cu0.6/X	217-219	7.42	5.34	48
*PF609-B	Sn/Ag3.8/Cu0.7/X	217-219	7.42	5.34	48
*PF610-B	Sn/Ag3.0/Cu0.5/ Ni0.06/Ge0.01	217-219	7.40	5.40	48
PF611-B	Sn/Ag3.0	217-220	7.34	6.60	27
*PF614-B	Sn/Ag4.0/Cu0.5/X	217~219	7.42	5.34	48
**PF636-B	Sn/Ag3.0/Cu0.5	217~219	7.40	5.30	47
**PF637-B	Sn/Ag3.5/Cu0.7	217~219	7.42	5.34	48
**PF638-B	Sn/Ag3.9/Cu0.6	217~219	7.42	5.34	48
**PF639-B	Sn/Ag3.8/Cu0.7	217~219	7.42	5.34	48
**PF640-B	Sn/Ag4.0/Cu0.5	217~219	7.42	5.34	48

" * " Fuji Electric Holdings Co. Patent No.:
Japan No.3296289, U.S No.6179935B1,
Germany No.19816671C2 (" * " add content of percentage of Ni and Ge) (Max:100ppm)

" ** " Iowa State University Research Foundation Inc Patent No.:
U.S No.5527628

Tin/Lead Bar Solder

Item / Product Code	Alloy Composition	Melting Point (°C)	Gravity	Remark
H63A-B20	Sn63/Pb37	183	8.4	Composed of high pure metal. Low impurities. Meets JIS Z 3282 A specification standards.
H60A-B20	Sn60/Pb40	190	8.5	
H63S-B20	Sn63/Pb37	183	8.4	Composed of high pure metal. Low impurities. Meets JIS Z 3282 A specification standards.
H60S-B20	Sn60/Pb40	190	8.5	

- All of Lead free and Tin Lead alloy composition can to meet customer requirement.

Tin/Lead Anti Oxide and Vacuum Formed Bar Solder

Item / Product Code	Alloy Composition	Melting Point (℃)	Gravity	Type	Remark
Sn63A-B20AA	Sn63/Pb37	183	8.4	Anti Oxide Bar solder	Decrease the 70% of dross compared with normal bar solder.
Sn60A-B20AA	Sn60/Pb40	190	8.5		
H63S	Sn63/Pb37	183	8.4	Vacuum Formed Bar Solder	Decrease the 40% of dross compared with normal bar solder.
H60S	Sn60/Pb40	190	8.5		

Lead Free Cored Wire

All alloy composition were to conform to SONY Green Partner and comply RoHS requirement

Item / Product Code	Alloy Composition	Melting Point (℃)	Gravity	Strength (kgf/mm)	Elongation(%)
PF601	Sn/Ag2.5/Cu0.5	220	7.40	5.30	57
PF603	Sn/Ag3.5	221	7.36	4.18	58
PF604	Sn/Cu0.7	227	7.32	3.80	50
*PF606	Sn/Ag3.0/Cu0.5/X	217~219	7.40	5.30	47
*PF607	Sn/Ag3.5/Cu0.7/X	217~219	7.42	5.34	48
*PF608	Sn/Ag3.9/Cu0.6/X	217~219	7.42	5.34	48
*PF609	Sn/Ag3.8/Cu0.7/X	217~219	7.42	5.34	48
*PF610	Sn/Ag3.0/Cu0.5/ Ni0.06/Ge0.01	217~219	7.40	5.40	48
*PF614	Sn/Ag4.0/Cu0.5/X	217~219	7.42	5.34	48
**PF636	Sn/Ag3.0/Cu0.5	217~219	7.42	5.34	47
**PF637	Sn/Ag3.5/Cu0.7	217~219	7.42	5.34	48
**PF638	Sn/Ag3.9/Cu0.6	217~219	7.42	5.34	48
**PF639	Sn/Ag3.8/Cu0.7	217~219	7.42	5.34	48
**PF640	Sn/Ag4.0/Cu0.5	217~219	7.42	5.34	48

" * " Fuji Electric Holdings Co. Patent No.: Japan No.3296289,U.S No.6179935B1,Germany No.19816671C2
(" * " add content of percentage of Ni and Ge) (Max:100ppm)

" ** " Iowa State University Research Foundation Inc Patent No.: U.S No.5527628

Tin/Lead Cored Wire

Item / Product Code	Alloy Composition	Melting Point (℃)	Gravity	Remark
RH63	Sn63/Pb37	183	8.4	Meets JIS Z 3282 E specification standards
RH60	Sn60/Pb40	190	8.5	
RH50	Sn50/Pb50	215	8.9	
RH40	Sn40/Pb60	238	9.3	

Flux for Cored Wire

Item / Flux Code	R	R906	AA	A	B
Flux Content (%)	3±0.5	3±0.5	2±1.0	2±1.0	2±1.0
Flux Type	ROL1	ROL0	ROL1	ROL1	ORH0
Halide Content(%)	< 0.1	0	< 0.1	0.1~0.5	0.5~1.0
Fluorine	None	None	None	None	None
Copper Plate Corrosion Test	PASS	PASS	PASS	PASS	PASS
Copper Mirror Test	PASS	PASS	PASS	PASS	PASS
Silver Chromate Test	PASS	PASS	PASS	PASS	PASS
SIR	1×10^9	1×10^9	1×10^9	1×10^9	1×10^9
Electro Migration	PASS	PASS	PASS	PASS	PASS
Remark	Lead Free Series	Lead Free Series	Tin Lead Series	Tin Lead Series	Tin Lead Series

S.I.R Test Condition: 85℃, RH 85% Electro Migration Test Condition: 65℃, RH 85%

Product Code Explanation:

PF606-R or PF606-R906

- Alloy code
- Flux code

Pure Electro-Plating Anodes

SHENMAO Electro-Plating Anode is made from pure metal combined to produce exact alloy compositions. We developed and produced under JIS Z 3282 specification standard. Available Diameters have 5mm, 25mm round ball; 25mm, 20mm semi round ball.

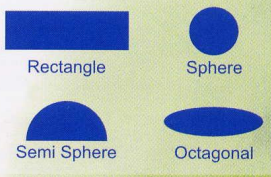
Item / Product Code	Alloy Composition	Melting Point (°C)	Gravity	Remark
99.95-BALL-H	Sn99.95	232	7.30	O 25mm Semi-Round Ball
99.95-BALL-S	Sn99.95	232	7.30	O 25mm Round Ball
99.99-BALL-B	Sn99.99	232	7.30	O 35mm Round Ball

Product Code Explanation:

63 - BALL, Anode, T - B or S or H or SSH

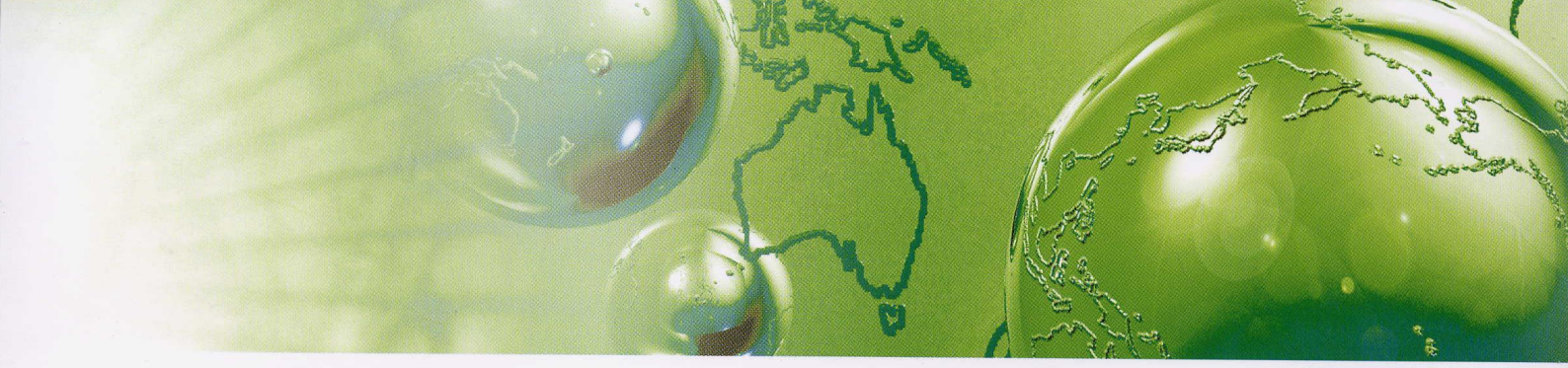
- 63 — Tin content
- BALL, Anode, T — Ball-Round, Anode-Bar, T-Ingot
- B — Round Ball 25mm
- S — Round Ball 25mm
- H — Semi-Round Ball 25mm
- SSH — Semi-Round Ball 20mm

shape available



Tin/Lead Electro-Plating Anodes

Item / Product Code	Alloy Composition	Melting Point (°C)	Gravity	Remark
60-BALL-H	Sn60/Pb40	190	8.5	All of alloy composition was produced under JIS Z 3282 specification standard
63-BALL-H	Sn63/Pb37	183	8.4	
80-BALL-H	Sn80/Pb20	202	7.8	
80-BALL-SSH	Sn80/Pb20	202	7.8	
85-BALL-SSH	Sn85/Pb15	209	7.7	
90-BALL-H	Sn90/Pb10	220	7.6	
90-BALL-SSH	Sn90/Pb10	220	7.6	



Liquid Flux Lead-Free Series

Shenmao offers a full line of Water-Soluble fluxes and No-Clean Flux for SMT and PCB Wave solder applications.

We provide halide-containing and halide-free liquid fluxes for Lead-Free solder alloys.

And also our Lead Free Liquid Flux have been approved by HP and Dell Computer.

We believe our customer can be able to reach the lead free era comfortably with SHENMAO material technologies service, then to brings their Pb-Free products to market quickly.

Test Item \ Flux Code	SM-813	SM-815	SM-816	SM-818
Appearance	Transparent to yellow liquid	Transparent to yellow liquid	Transparent to yellow liquid	Transparent to yellow liquid
Flux	ROL1	ROL1	ROL1	ROL1
Flux Type	VOC	VOC	VOC	VOC
Acid Number mgKOH/g	19±5	18.5±3.5	20±5	20±5
Solids Content (%)	3.2±0.5	3.9±0.5	3.4±0.5	3.2±0.5
Specific Gravity (20℃)	0.795±0.009	0.794±0.008	0.794±0.008	0.794±0.008
Halide Content (%)	< 0.01	< 0.01	< 0.01	< 0.01
Fluorine	None	None	None	None
Copper Plate Corrosion Test	PASS	PASS	PASS	PASS
Copper Mirror test	PASS	PASS	PASS	PASS
Silver Chromate Test	PASS	PASS	PASS	PASS
SIR	> 1 x 10^9	> 1 x 10^9	> 1 x 10^9	> 1 x 10^9
Electro Migration	PASS	PASS	PASS	PASS
Remark	Recommended for foaming、Dipping and spraying Application	Recommended for foaming、Dipping and spraying Application	Recommended for foaming、Dipping and spraying Application	Recommended for foaming、Dipping and spraying Application

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Liquid Flux Tin/Lead Series

Test Item \ Flux Code	SM-65	SM-84	SM-805	SM-826
Appearance	Yellow	Yellow Brown	Transparent to yellow liquid	Transparent to yellow liquid
Flux	ROL1	ROL1	ROL1	ROL1
Flux Type	VOC	VOC	VOC	VOC
Acid Number mgKOH/g	34±8	32±7	14±5	16±4
Solids Content (%)	11±2	17.4±2	2.6±0.4	2.1±0.4
Specific Gravity (20°C)	0.824±0.015	0.827±0.015	0.791±0.008	0.793±0.008
Halide Content (%)	< 0.05	< 0.05	< 0.01	< 0.01
Fluorine	None	None	None	None
Copper Plate Corrosion Test	PASS	PASS	PASS	PASS
Copper Mirror test	PASS	PASS	PASS	PASS
Silver Chromate Test	--	--	PASS	PASS
SIR	> 1×10^9	> 1×10^9	> 1×10^9	> 1×10^9
Electro Migration	PASS	PASS	PASS	PASS
Remark	Recommended for foaming、Dipping and spraying Application	Recommended for foaming、Dipping and spraying Application	Recommended for foaming、Dipping and spraying Application	Recommended for foaming、Dipping and spraying Application