

Alloys that we've selected

- SN100C
 - Nihon Superior Patented Alloy
 - Wave Solder Only
 - Tin 99% Copper 0.5% Nickel 0.05%
 - Melting Point 227° C
 - Lower Cost Pb Free Alternative – No Silver
 - Can be run at 500° F
 - Other wave solder alloys are 525° F - 530° F
 - Trace Elements of Nickel effect solidification of solder
 - Visibly Tighter Grain Structure
 - Tighter Grain Structure = Increased Joint Strength

		SnPb	SN100C	Δ
Wave	Top Side Preheat	180~210C	200~240C	20~30C
	Pot Temperature	250~260C	260~280C	0~20C



Why SN100C?

- True Eutectic Alloy
 - No Plastic State
- Behaves more like SnPb
- Current Standard in Japan
- Detailed Reliability Data being released March 16th.
- JCAA/JG-PP Study to release data
 - Preliminary Findings Excellent for SN100C
 - APSCO Participating in Study

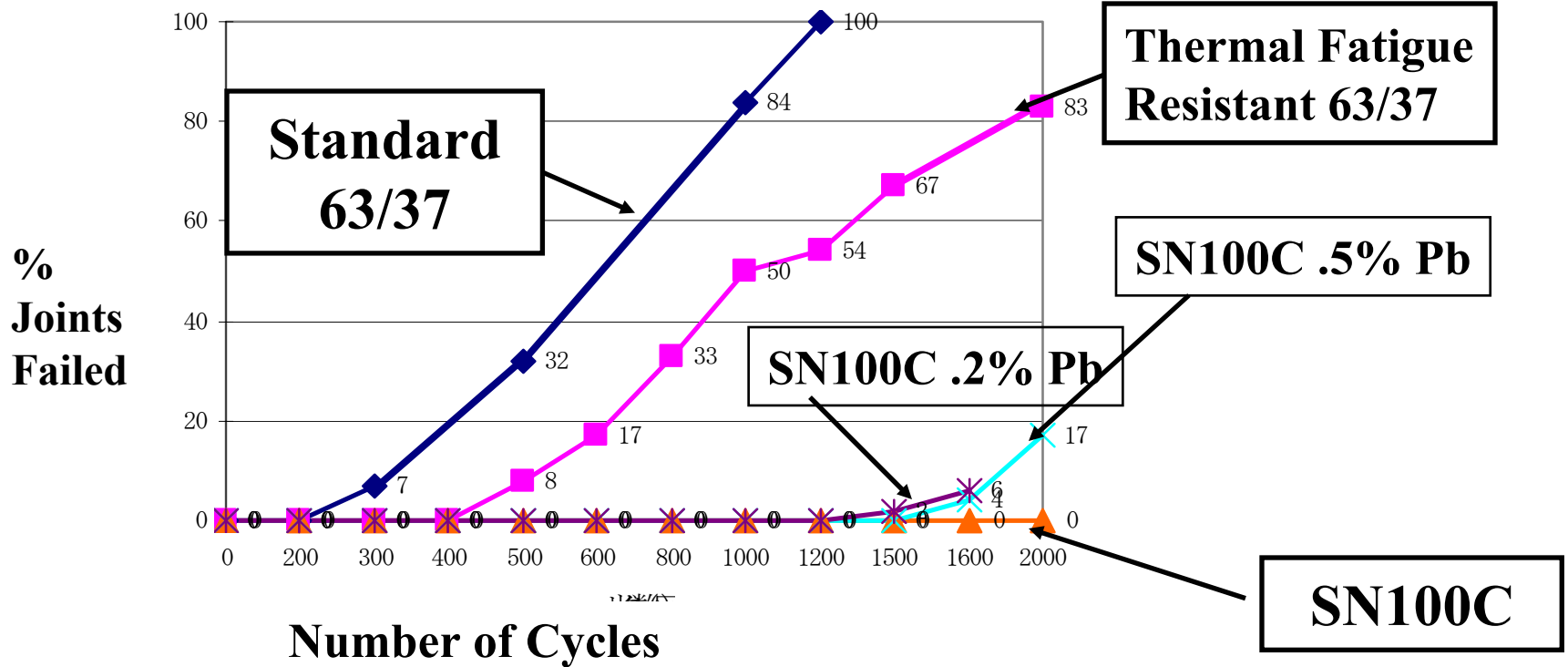


Properties of SN100C

PROPERTY	ALLOY		METHOD	
	SN100C	63Sn/37Pb		
Tensile Strength kgf/mm ²	3.3	4.5	10mm/min	25° C
Elongation %	48	25	10mm/min	25° C
Creep Strength Time to Failure	>300hr	20hr	145° C 1kg load	
	>300hr	3hr	150° C 1kg load	
	>300hr	7min	180° C 1kg load	
Thermal Cycle Cycles to Failure	>1000	500-600	- 40° C/+80° C	

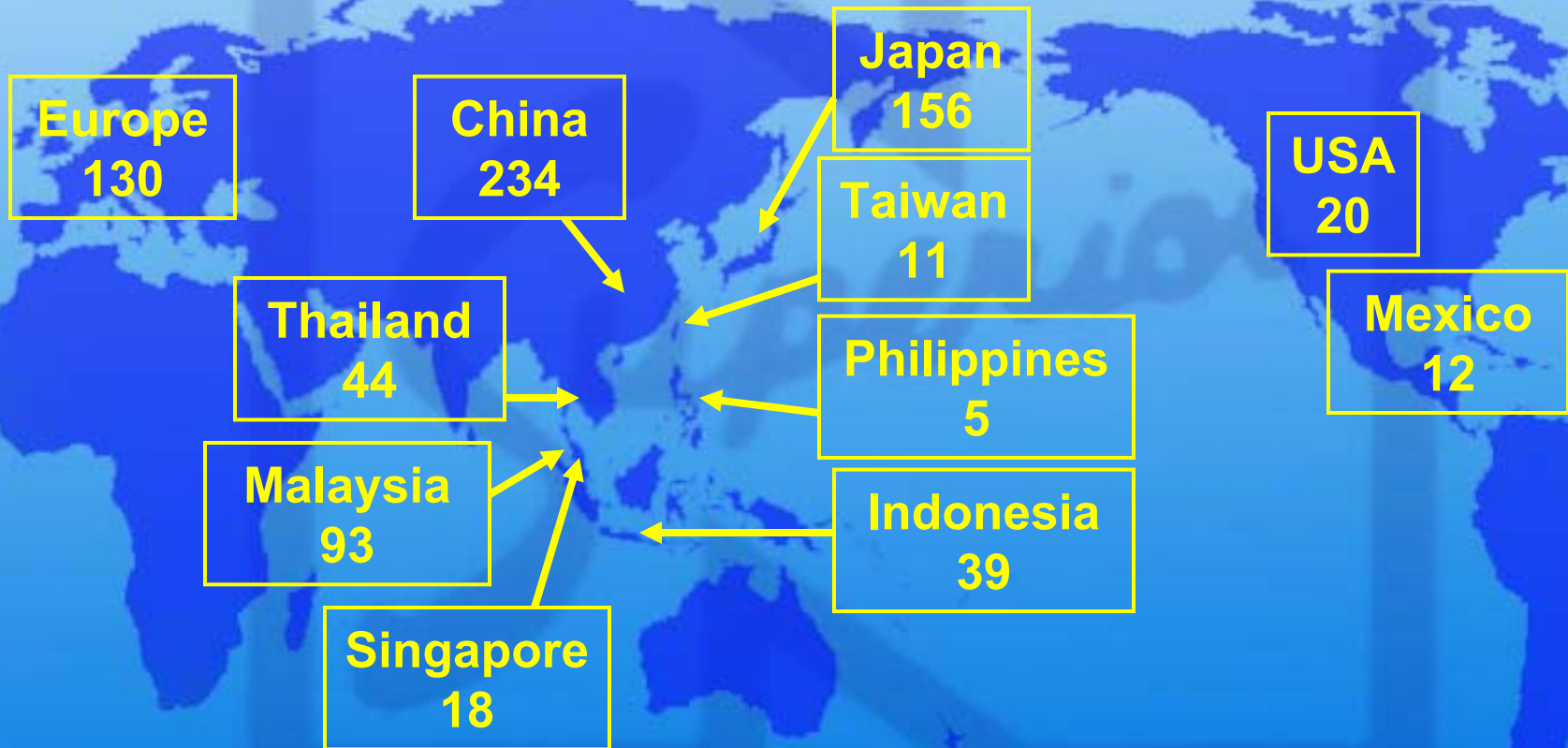
Properties of SN100C

Thermal Cycle Testing



WAVE SOLDERING MACHINES RUNNING WITH Ni-Modified Sn-Cu Eutectic

January 2005



Total: 756 + 103 Scheduled

An increase of 91 over the December/ January period

Experience with SN100C

COMPANY	PRODUCTS MADE WITH SN100C
Matsushita	Video, Vacuum Cleaner, Microwave Oven, Rice Cooker, Air conditioner, Refrigerator, Dehumidifier, Lighting
Pioneer	PDP/CATV Tuner, DVD-RW, DVD Audio
Seiko Epson	Printer, Components
Mitsumi	Hand Phone Battery Charger
Hitachi	Notebook Computer, Dehumidifier, Refrigerator
Sony	Car CD Player, PA System
Fuji Xerox	Photocopier
Fuji Film	Camera
Daikin	Air conditioner
Fiji Electric Wire	Wire Coating



Experience with SN100C

**Estimate more than
200 million
printed circuit board assemblies
produced with SN100C
and in service
since 1999.**



Why SN100 rather than Sn-0.7%Cu

Wave Soldering at 250°C, 3-4 second contact time



Bridging

Sn-0.7%Cu



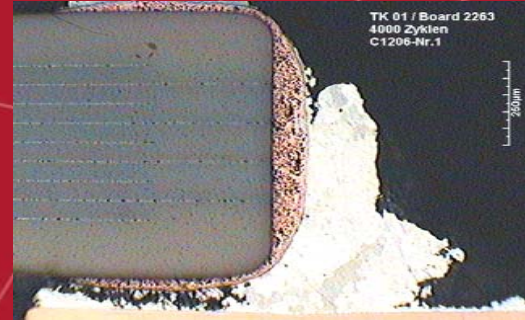
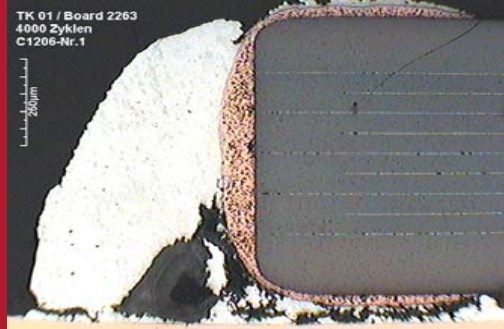
No Bridging

SN100C

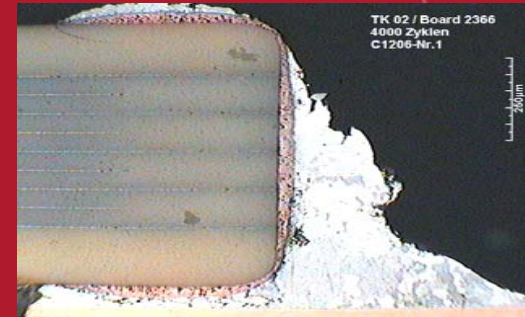
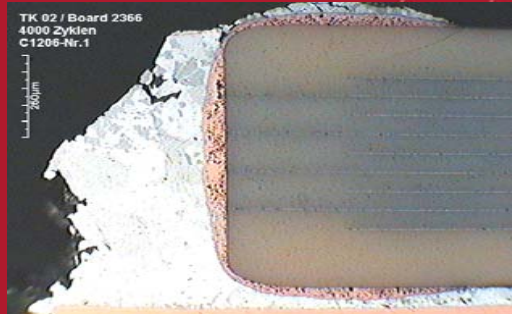
Reliability Comparison

SN100CL HASL / FR4 / CMC1206: 4000 cycles -40 - +125°C

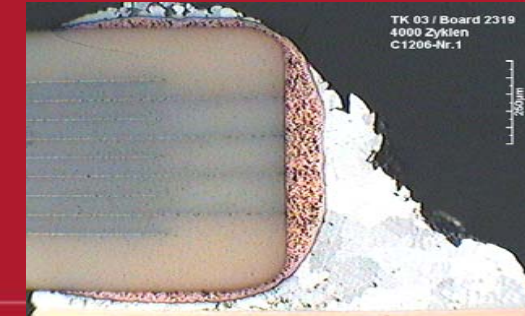
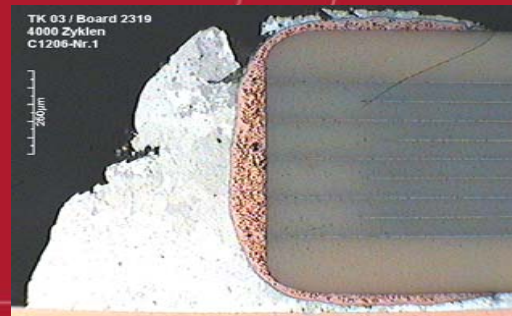
63/37 Sn/Pb



SAC alloy



SN100C



Worst



Best



JCAA/JG-PP Test Results on SN100C

Preliminary & Confidential



Vibration Test Data (Manufactured Vehicles)

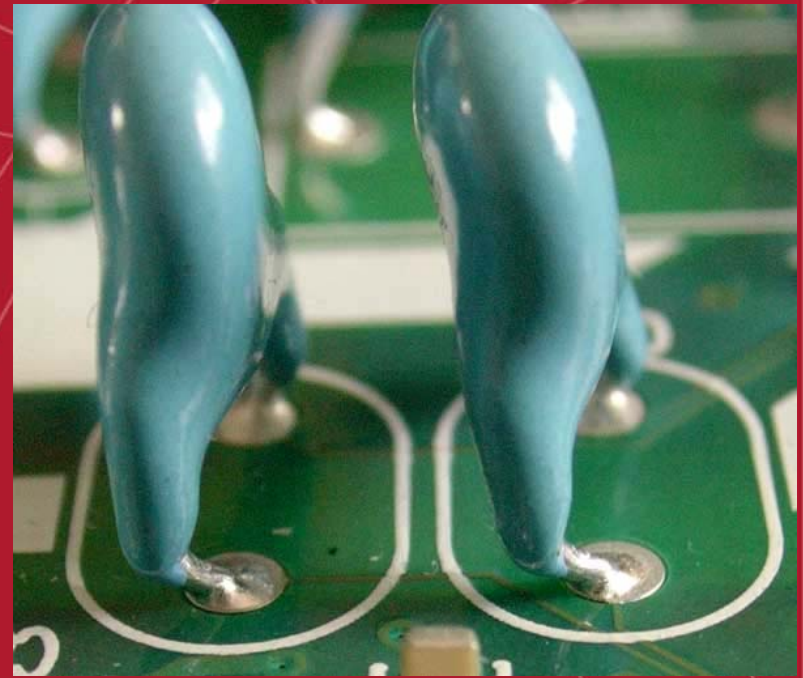
Component	Reference Designator	Solder/Finish	Relative Solder Ranking			
			Sn37Pb	Sn3.9Ag0.6Cu	Sn3.4Ag1.0Cu3.3Bi	Sn0.7Cu0.05Ni
PDIP-20	U8	Pb-Free/NiPdAu or SnPb/NiPdAu	3	2		1
PDIP-20	U23	Pb-Free/NiPdAu or SnPb/NiPdAu	Not enough failures to rank			
PDIP-20	U35	Pb-Free/NiPdAu or SnPb/NiPdAu	3	2		1
PDIP-20	U49	Pb-Free/NiPdAu or SnPb/NiPdAu	3	2		1
PDIP-20	U59	Pb-Free/NiPdAu or SnPb/NiPdAu	Not enough failures to rank			
PDIP-20	U11	Pb-Free/Sn or SnPb/Sn	2	3		1
PDIP-20	U30	Pb-Free/Sn or SnPb/Sn	1	2		1
PDIP-20	U38	Pb-Free/Sn or SnPb/Sn	2	1		1
PDIP-20	U51	Pb-Free/Sn or SnPb/Sn	2	3		1
PDIP-20	U63	Pb-Free/Sn or SnPb/Sn	2	3		1



Comparing SN100C with Tin/Lead



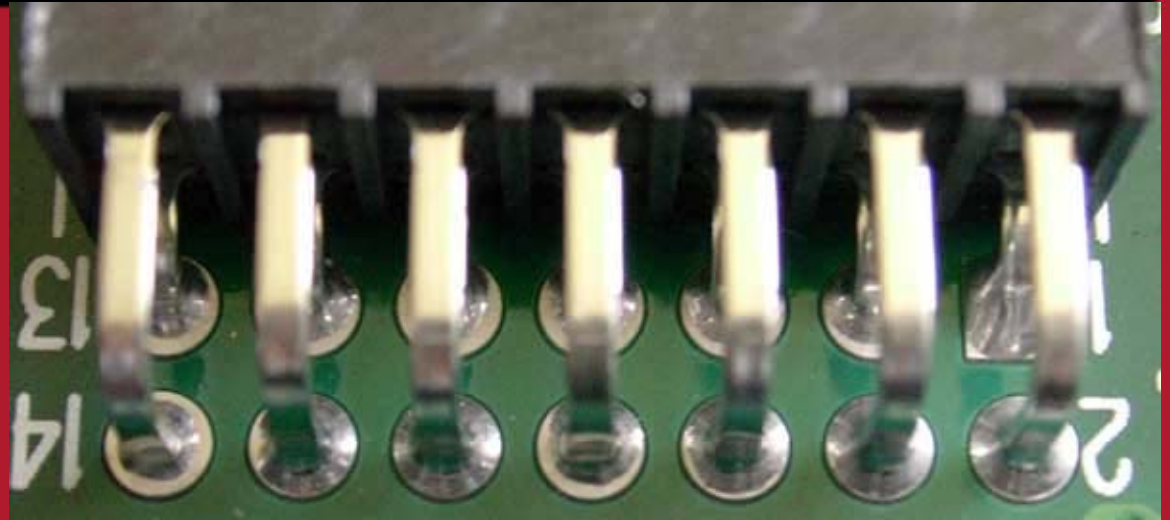
Sn-37Pb



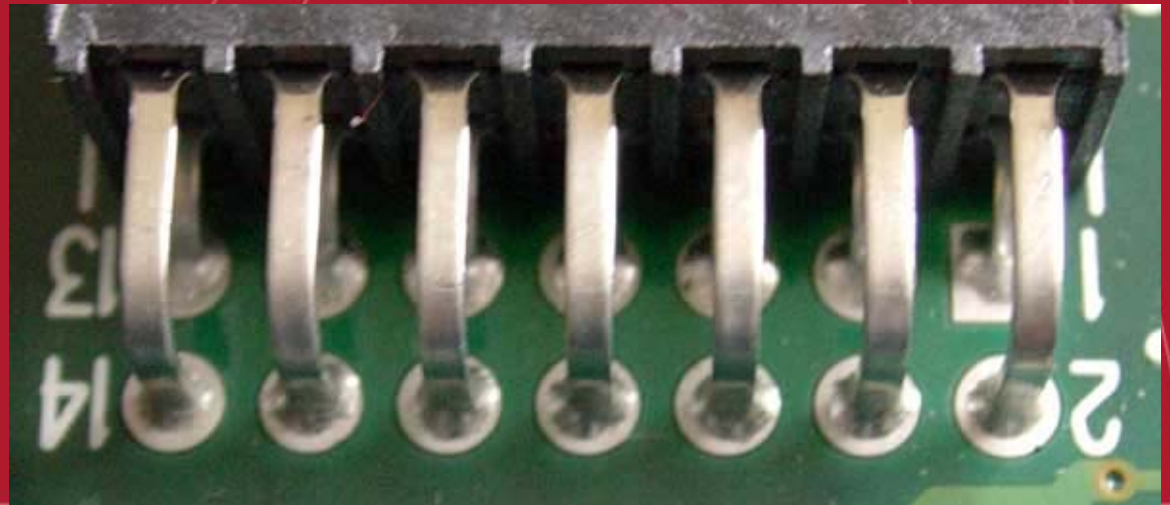
SN100C

Comparing SN100C with Tin/Lead

Sn-37Pb

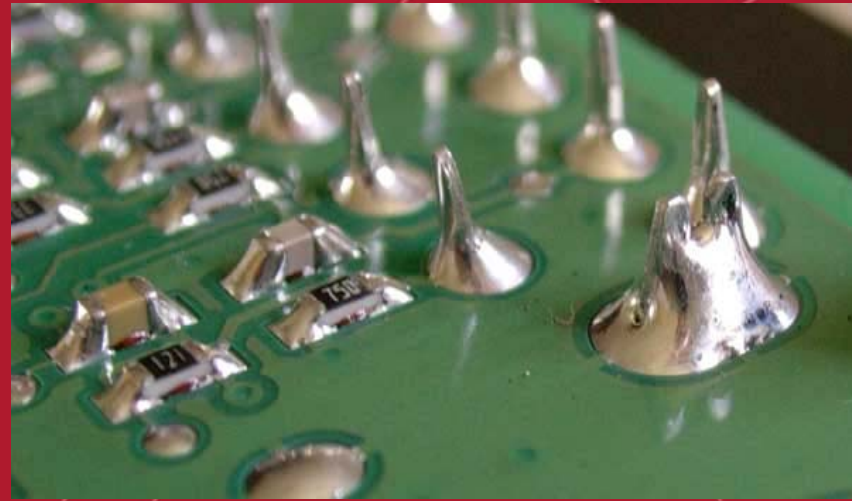


SN100C



Comparing SN100C with Tin/Lead

Sn-37Pb



SN100C

