



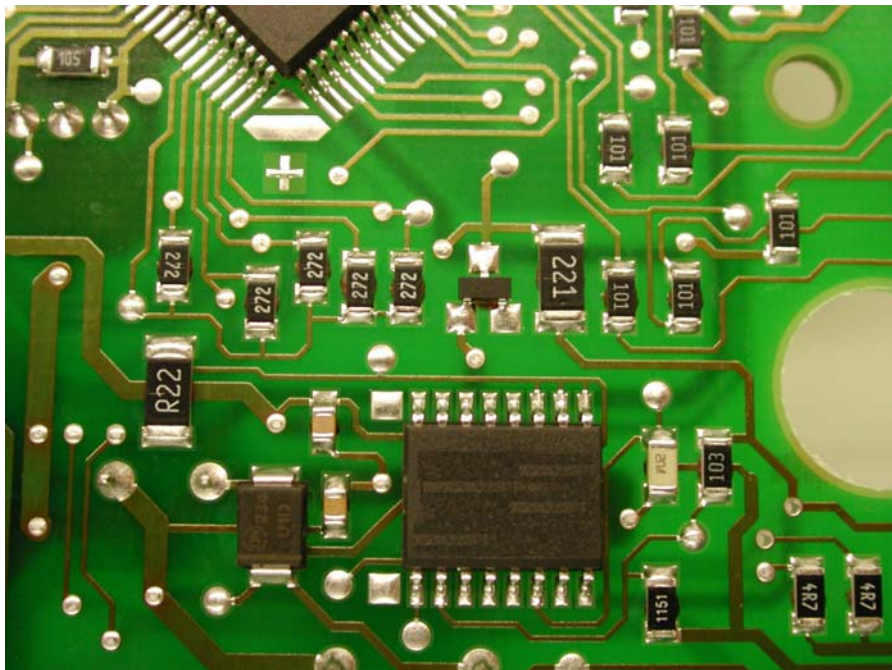
SN100C® LEAD-FREE WAVE SOLDER

(Tin/Copper/Nickel/Germanium)

Bridge-free wave soldering at 250 - 255°C with economical Sn-Cu-Ni+ Ge solder is possible with SN100C® from Nihon Superior and DKL Metals

WITH MORE THAN 8000 LINES IN COMMERCIAL PRODUCTION, SOME FOR OVER 13 YEARS AND MANY HUNDREDS OF MILLIONS OF BOARDS IN SERVICE, *SN100C IS PROVEN IN LEAD-FREE WAVE SOLDER PRODUCTION*

- No shorts on QFP to 0.5mm, 100 Pins
- Good through-hole penetration
- Eutectic alloy
- Does not contain bismuth or silver
- Lower drossing than other lead free alloys
- Less aggressive to stainless steel compared to SAC (Sn/Cu/Ag) alloys
- Smooth, bright well-formed fillets
- Does not require nitrogen atmosphere
- Bridge-free, icicle-free soldering
- Low cost of ownership
- Easy pot management – low Cu leaching rate



Wave-soldered with SN100C®

Description

SN100C® is a lead-free solder alloy developed and patented by Nihon Superior Co. Ltd of Japan. The alloy is based on the tin/copper eutectic alloy with the addition of a small quantity of nickel and germanium which modifies its behaviour to the extent that in wave-soldering the resultant alloy exhibits fluidity and wetting properties comparable to that of the traditional tin/lead solder it is designed to replace. Wave-soldering performance easily matches that of the more expensive silver containing solders available. Low aggressivity to stainless steel, low copper leaching rates and low dross rates combine to offer substantial cost savings to the user, **making SN100C® the most cost-effective alloy choice for lead free wave-soldering.**



www.dklmetals.co.uk



Technical Specification

TEST	SOLDER ALLOY		TEST METHOD
	SN100C®	Sn63 Pb37	
Alloy System	Sn/Cu/Ni + Ge	Sn/Pb	
Melting Temperature °C	227°C Eutectic	183°C Eutectic	DSC
Specific Gravity	7.4	8.4	S.G. Measuring Apparatus
Specific Heat (J/kg • K)	220	176	Estimated
Thermal Conductivity (J/m • s • K)	64	50	Estimated
Tensile Strength (M • Pa)	32	44	10mm/min (25°C)
Elongation (%)	48	25	10mm/min (25°C)
Spread Factor (%)	230°C	-	JIS Z 3197 (NS-828A FLUX)
	240°C	77	
	250°C	77	
	260°C	78	
	280°C	78	
Electrical Resistance (μΩm)	0.13	0.17	Four Terminal Method
Copper Erosion Rate at 260°C	Approx. 2 minutes	Approx. 1 minute	Time for complete erosion of 1.8mm dia. wire
Creep Strength (Time to Failure)	>300HRS	20HRS	145°C, 1kg load
	>300HRS	3HRS	150°C, 1kg load
	>300HRS	7 MIN	180°C, 1kg load
Thermal Shock	>1000 cycles	500-600 cycles	-40/+80°C Each 1HR
Electromigration	>1000HRS	>1000HRS	40°C, 95% RH & 85°C, 85%RH
Whisker Test	>1000HRS	>1000HRS	50°C

Recommended Operating Parameters

One of the major process changes using SN100C® and other lead free alloys compared with standard tin/lead Sn63 is the difference between the processing temperature and the melting point of the alloys: Therefore care must be taken to ensure the process settings are optimised. Based on over 13 years of production on 8000+ wave solder machines, the following guidelines have been established:

- Control air drafts in machine.
- Close off openings.
- Adjust damper to reduce drafts.
- Minimise gap between preheaters and pot
- Ensure cooling fans blow away from pot.
- Ensure adequate preheat for board type as listed below:

PC Board Type	Recommended Preheat Temperature Range (°C)
Single-sided. Simple double-sided	90-100
Double-sided	100-115
Heavy double-sided, multilayer	120-135

- Ensure temperature in the wave meets requirement listed below:

PC Board Type	Recommended Pot Temperature Range (°C)
Single-sided. Simple double-sided	250-255°C
Double-sided	255-260°C
Heavy double-sided, multilayer	260-265°C

Alloy Specification:

Element	Typical SN100C®	Typical SN100C®e	Recommended T.A.L. - Wave
Tin (Sn)	Bal	Bal	
Copper (Cu)	0.65	<0.20	0.85
Nickel (Ni)	0.050	0.050	0.04 – 0.08
Zinc (Zn)	<0.0005	<0.0005	0.005
Silver (Ag)	0.001	0.001	0.15
Antimony (Sb)	0.010	0.010	0.05
Lead (Pb)	0.02	0.02	0.1
Cadmium (Cd)	0.0001	0.0001	0.005
Bismuth (Bi)	0.002	0.002	0.05
Iron (Fe)	0.003	0.003	0.02
Arsenic (As)	0.001	0.001	0.05
Aluminium (Al)	<0.0001	<0.0001	0.002
Gold (Au)	0.0002	0.0002	N/A *

*Combine with Copper

Recommended Solder Bath Operating Conditions

To ensure the continued optimum performance of SN100C® solder in your manufacturing process it is important that periodic analysis of the solder bath contents is undertaken to verify that the alloy composition is maintained within strict limits. Any build-up of undesirable impurity elements or an increase in the copper content may lead to poor flow characteristics, potentially compromising joint structure, with a consequent rise in defect rates. In most applications rising copper levels can be controlled by topping-up bath levels with SN100C®e copper-free alloy.

Verification of bath copper content is easy with our free solder bath analysis programme which gives you a full analysis along with trend graphs allowing you to track copper and other contaminant levels over time.

Availability

STYLE	NOM. WEIGHT	DIMENSIONS	PACKING
Bar	1kg	300 x 32 x 12mm	20kg Carton
Autofeed Ingot	4kg	500 x 45 x 33mm	Ingot
Chunks (chopped bar)	-	-	20kg Tub

Please contact us with any specific non standard bar or ingot size to check on availability.

The information given in this technical data sheet is to the best of our knowledge accurate. It is intended to be helpful but no warranty is expressed or implied regarding the accuracy of such data. It is the users responsibility to determine the suitability of his own use of the product described herein: and since conditions of use are beyond our control, we disclaim all liability with respect to the use of any material supplied by us. Nothing contained herein shall be construed as permission or as recommendations to practice any patented invention without a license from the patent owner nor as recommendation to use any product or to practise any patented invention without a license from the patent owner nor as recommendation to use any product or to practise any process in violation of any law or any government regulations.



DKL Metals Limited
Bo'ness Road, Grangemouth, Stirlingshire, FK3 9XF, U.K.

Telephone: +44(0) 1506 847710 Fax: +44 (0)1506 848199
E-mail: sales@dklmetals.co.uk Web: www.dklmetals.co.uk