SOLDER SN100C VARIANTS

Lead-free alloy for electronics

DESCRIPTION

SN100C is a silver-free, micro-alloyed solder alloy developed and patented by the Japanese company Nihon Superior (European Patent No. 0985486; German Patent No. DE 69918758).

The micro-alloying element nickel reduces copper accumulation in the solder bath, thereby supporting stable and well-controlled process conditions. The second micro-alloying element, germanium, minimizes dross formation, which conserves resources and contributes to environmental protection. In addition, nickel promotes the formation of a finer intermetallic phase in combination with tin and copper, resulting in increased stability of the solder joints.

Furthermore, the alloy is characterized by excellent wetting behaviour, while the tendency toward bridge formation is significantly reduced.

CHARACTERISTICS

The product offers the following advantages:

- **micro-alloyed, eutectic alloy (melting point at 227 °C)**
- **reduced dissolution rate in comparison with S-Sn99.3Cu0.7 alloy**
- **reduced dross formation in comparison with S-Sn99.3Cu0.7 alloy**
- **reduced tendency for bridging and icicle formation**
- **shiny solder joints**
- **does not contain any silver – cost-optimized solution**

APPLICATION

SN100C can be used with the same parameter settings on your soldering process as any other lead-free alloy based on SnCu or SnCuAg. When changing from lead containing to lead-free alloys, adjustments of the temperature profiles must be made.

The characteristics of the resulting solder joints are comparable with or better than Sn/Pb solder joints in all respects. The physical properties are not changed by the micro-alloyed additives.

The differences between lead-free standard solders and SN100C are:

- **solidification of the solder joint creates finer grain structures, resulting in shiny solder joint surfaces**
- **reduced dissolution rate of copper – less copper is removed from the PCB and added to the solder bath**
- **reduced dross formation**

Depending on the level of process control and the soldering method used, two aspects must be considered when working with SN100C. During operation, the germanium content in the solder gradually decreases. If the germanium level falls below 20 ppm, dross formation will increase. In such cases, we recommend adding our anti-oxidation additive **S-Sn99Ge1** to restore the germanium content to the required level.

Despite the reduced dissolution rate of SN100C, the copper content in the solder bath may also rise to critical levels over time. In this situation, we recommend using the alloy **SN100Ce**, which has a reduced copper content, as refill solder.

As part of our customer support, we offer an analysis service to regularly check the composition of your solder bath. Our laboratory and application engineers are also available to support you with any technical questions.

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PHYSICAL PROPERTIES AND DATA

ELEMENT	SN100C	SN100C04	SN100C07-S	SN100C04-S	SN100CL	SN100CS	SN100CS+
Sn:	Rem.	Rem.	Rem.	Rem.	Rem.	Rem.	Rem.
Cu:	0,65	0,4	0,65	0,35	0,65	0,65	0,65
Ni:	0,05	0,05	0,02	0,02	0,05	0,05	0,05
Ge:	0,006	0,006	0,006	0,006	0,006	0,010	0,025

The data in the table are typical values, they do not represent a specification.
Content by mass in %.

GENERAL PROPERTIES	SN100C
Melting point, °C	227
Density, g/cm³	7.4
Tensile strength, MPa 10 mm/min at 25 °C	32
Elongation at break, %	48
Electrical conductivity, µΩm	13
Specific melting heat, J/g	61

RECOMMENDED OPERATING CONDITIONS

Wave soldering and selective soldering systems. The recommended operating conditions are the same as for lead-free SnCu alloys as the melting point remains the same.

SUPPLY FORMS

- wire (solid and flux cored)
- triangular bars
- kilobars
- ingots with hanger hole
- pellets (approx. Ø 5 mm x 30-35 mm)

HEALTH AND SAFETY

Read the material safety data sheet carefully before use and observe the safety precautions described.

DISCLAIMER

The above values are typical and represent no form of specification. The Data Sheet serves for information purposes. Any verbal or written advise is not binding for the company, whether such information originates from the company offices or from a sales representative. This is also in respect of any protection rights of third parties, and does not release the customer from the responsibility of verifying the products of the company for suitability of use for the intended process or purpose. Should any liability on the part of the company arise, the company will only indemnify for loss or damage to the same extent as for defects in quality.