SCS7 Lead Free Solder Alloy

RoHS compliant

Product Description

SCS7, an enhanced tin/copper lead free alloy, is highly recommended to directly replace existing SnCu0.7 solder in the high temperature wave soldering applications. This alloy not only exhibits the excellent ductility of SnCu0.7 solder, it possesses superior mechanical strength both in ambient and high temperature environments. SCS7's fatigue resistance is now comparable to tin/lead solder and as such, SCS7 has addressed the fundamental concerns of tin/copper alloys. Besides, it offers benefits of low drossing and good wettability. Its applications cover wave soldering, dipping processes, manual/auto soldering and solder joints touch up using solder wires. This cost effective alloy has been designed to meet the most stringent requirements of the electronics industries.

Alloy Composition

Main Composition		**IPC J-STD-006 Specs (wt%)**
Tin	Sn	Remainder
Copper	Cu	0.7 ± 0.1
Silicon	Si	0.02 ± 0.01
Contamination		
Silver	Ag	0.10 max
Aluminium	Al	0.005 max
Arsenic	As	0.03 max
Bismuth	Bi	0.10 max
Cadmium	Cd	0.002 max
Iron	Fe	0.02 max
Indium	In	0.10 max
Nickel	Ni	0.01 max
Lead	Pb	0.05 max
Antimony	Sb	0.05 max
Zinc	Zn	0.003 max

* World Patent No. 2006/045995 A1
* US Patent No. 7472817
* Japanese Patent No. 4048288

Specification

Item	**Result**
Alloy Melting Point DSC at 5°C/min	227°C
Density Water Displacement Method	7.30 g/cm^3

Spread Factor

JIS Z 3197 8.3.1.1

235°C	> 75%
245°C	> 78%
255°C	> 81%

Wettability

IPC-TM-650 2.4.14.2

JIS Z 3197 8.3.1.2

235°C	0.16 mN, 5.15sec
245°C	3.38 mN, 1.64sec
255°C	4.30 mN, 0.61sec

Mechanical Properties (As-Cast)

Instron Series IX Automated Materials Test System

ASTM E8M (3 mm/min at 23°C)

Tensile Strength	45.83 MPa
Yield Strength	38.78 MPa
Max Percent Strain	68.16 %
Energy to Yield Point	0.203 J
Energy to Break Point	18.05 J
Toughness	25.54 MPa

Creep Resistance > 40hrs @ 145°C

Load at 1kg

Cycle Fatigue Resistance 3000 – 3500 N_f

ASTM E606-92

Application

For wave soldering applications, the solder can be used at 255 – 265°C, depending on PCB design & complexity. Conveyor speed can be set up to a maximum of 1.8 m/min for single-sided boards and recommended to set at between 1.2m/min to 1.6m/min for double-sided boards.
Recommendation of preheat on-board temperature (refer to flux specification) dependent on flux activation temperature, machine design and board complexity.

For dipping applications, it is recommended to use at temperatures > 260°C, depending on applications.

Drossing Rate

Data collection was done by actual simulation using a conventional wave soldering machine with dual wave turned on, under ambient condition. The drossing rate is estimated to be 0.7~0.9kg per hour. A single wave or wave nozzles that are less turbulent will reduce drossing rate.

Top-up Solder

Control limit for Cu% is 0.5% to 1.0%. SCS2 is recommended for top-up purpose when the Cu% is ≥0.7% whereas SCS7 is recommended for top-up purpose when the Cu% is <0.7%. Please refer to Asahi technical staffs for more information on the control of Cu% in the solder pot.

Storage

Store the solder alloy in a cool, dry and non-corrosive environment. Wrap up the solder alloy when not in use to reduce exposure to environment. SCS7 lead free solder bar and solid wire can be kept for 5 years if proper storage conditions are observed.

Health & Safety

The product when use or handling maybe hazardous to health or environment. Please refer to Material Safety Data Sheet for more information.

Packaging

Solder Bar: 25kg per box, Solid Wire: 20kg per roll (Diameter: 0.25, 0.3, 0.4, 0.5, 0.6, 0.8, 1.0, 1.2, 1.6, 2.0 and 3.0 mm). For any other packing requirements, please refer to the sales department.

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