

High durability solder paste

SB6N58-M500SI

Alloy composition: Sn Ag3.5 Bi0.5 In6.0

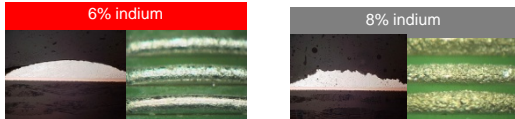


- Designed to be used for automotive applications
- Anti-crack alloy with 6.0% Indium content
- Equivalent wetting and printing properties to conventional Pb free solder paste
- Halogen free (Cl, Br \leq 900ppm / Cl + Br \leq 1500ppm)



◆ Optimization of Indium content (6.0%)

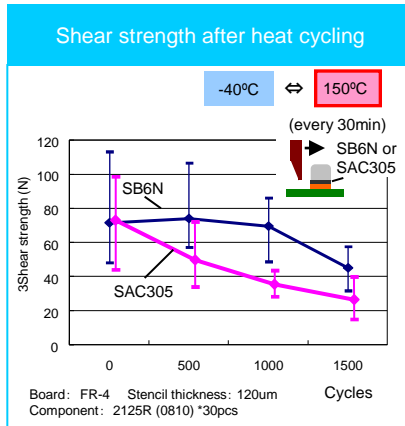
■ Solder formulation after heat cycling test (-40 – +125°C x 500 cycles)



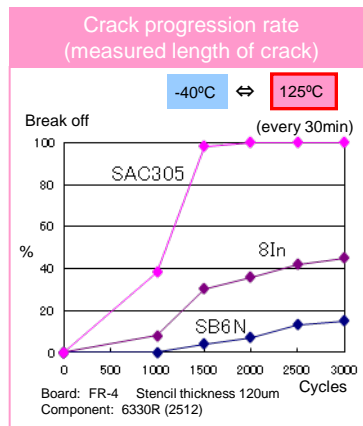
While indium is a flexible and elastic metal, which can absorb the mechanical stress given to solder alloy to improve heat cycling properties, deformation of the solder could occur at high temperature if added excessively.

We found the optimal indium content of 6% achieves both excellent heat cycling properties and no solder joint deformation in customer applications.

◆ Anti-crack property



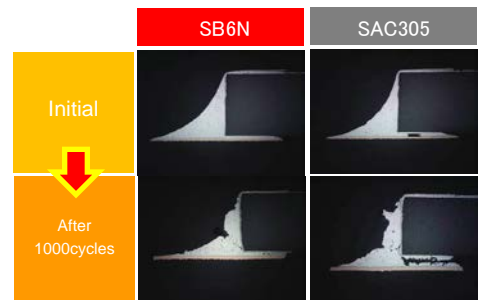
SB6N retains higher shear strength than SAC305 as heat cycles are applied.



SB6N delays crack progression dramatically.

■ Cross section images after heat cycling

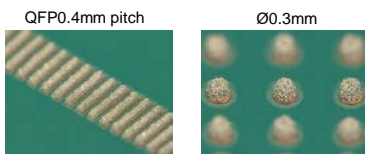
- Board: Glass & epoxy FR-4
- Surface finishing: OSP
- Stencil thickness: 0.12mm (Laser cut)
- Component: 3216R Chip
- Heat cycling condition: -40°C/30min. ↔ 150°C/30min.



◆ Printing / wetting performance

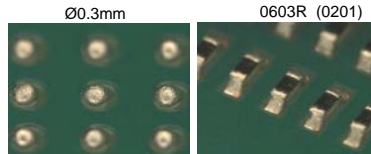
■ Printing property

By optimizing flux composition for indium containing alloy, SB6N58-M500SI secures equivalent printability to conventional Pb free solder paste even though Indium normally very easily causes viscosity increase due to chemical reactions between Indium and the activator in the flux.



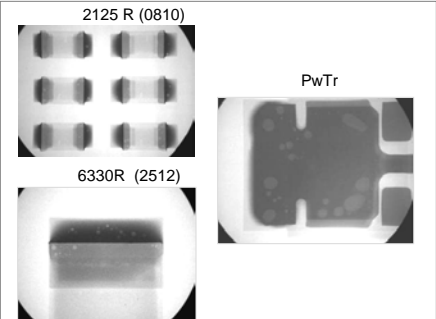
■ Wetting property with small component

Board: FR-4 Stencil thickness: 120um
Component: 0603R, 6330R, PwTr
Atmosphere: Air
Preheat temp.: 130 – 165°C for 70sec.
Peak temp.: >220°C for 45sec.
Maximum temp.: 230°C



◆ Voiding property

■ X-ray images of components



◆ Product specifications

Product name	SB6N58-M500SI
Alloy composition	Sn Ag3.5 Bi0.5 In6
Melting point (°C)	202-210
Particle sizes	20-38µm(58)
Viscosity (Pa.s)	200±30
Flux content (%)	11.1±1.0

◆ SB6N alloy series line-up

SB6N58-M500SID	Dispensing type with high durability alloy
SB6N-70M	Solder wire with high durability alloy