

## PRODUCT DATA SHEET

# Indalloy®133 for Preforms

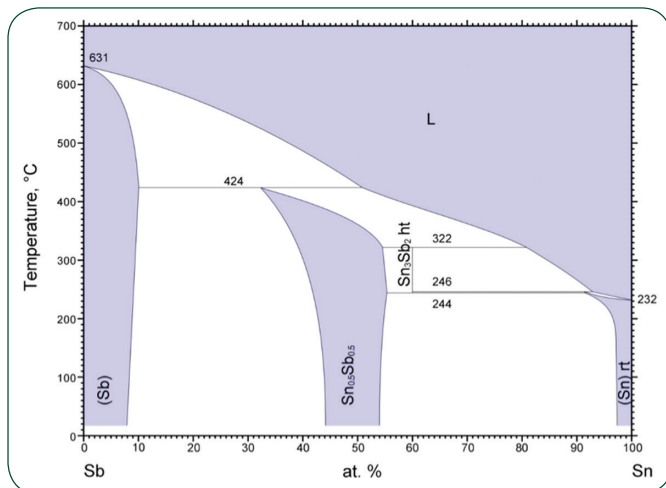
### Introduction

Indalloy®133 (95Sn/5Sb) solder is a common lead-free solder. Antimony added to tin increases the melting temperature rather than forming a lower melting eutectic.

The stability of the SnSb intermetallic compound (IMC) is an advantage in higher temperature applications where the stability of SAC (SnAgCu) alloys is marginal. The tin matrix of the SnSb alloy remains ductile while the 3% Sb in solution provides solid solution strengthening. The grain refining effects of the IMC promotes toughness at low temperatures associated with finer grain sizes.

### Metallurgy

Below is the binary SnSb phase diagram. The melting temperature of Sn increases from 232 to 244°C as Sb is added to the peritectic composition at ~10% Sb. Antimony has ~3% solubility in tin with the remainder forming the very stable SnSb IMC. During soldering, this SnSb IMC remains as a finely dispersed solid. The compound forms as equiaxed particles rather than needles or plates, providing a grain refining benefit without the detrimental formation of crack initiating plates.



B. Legendre, et al., *Sb-Sn Phase Diagram, ASM Alloy Phase Diagrams Database*, P. Villars, editor-in-chief; H. Okamoto and K. Cenozal, section editors; <http://www.asminternational.org>, ASM International, Materials Park, OH, 2016.

### Properties

Selected Properties	Metric	Imperial
Liquidus	237 °C	459 °F
Solidus	240 °C	464 °F
Density	7.25 g/cc	
Thermal Conductivity	64.7 W/mK	
CTE	31 ppm/°C	
Electrical Conductivity	11.9 μ Ohm-cm	
Young's Modulus	49 GPa	7,100 ksi
Poisson Ratio	0.38	
Tensile Strength	40.68 MPa	5,900 psi
Yield Strength	22 MPa	3,200 psi
Elongation	38 %	

### Available Forms

Indalloy®133 solder is available as preforms, ribbon, wire, and paste. Preform shapes include discs, squares/rectangles, washers, frames, and special shapes.

### Packaging

Packaging of all products is available to fit your manufacturing process.

### Technical Support

Indium Corporation's internationally experienced engineers provide in-depth technical assistance to our customers. Thoroughly knowledgeable in all facets of Material Science as it applies to the electronics and semiconductor sectors, Technical Support Engineers provide expert advice in solder properties, alloy compatibility and selection of solder preforms, wire, ribbon, and paste. Indium Corporation's Technical Support engineers provide rapid response to all technical inquiries.

### Safety Data Sheets

The SDS for this product can be found online at <http://www.indium.com/sds>

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