# PRODUCT DATA SHEET Indalloy<sup>®</sup>256 (SAC305) for Preforms

#### Introduction

SAC305 is a widely used lead-free solder alloy made of tin (Sn), silver (Ag), and copper (Cu), with the composition of 96.5% tin, 3.0% silver, and 0.5% copper. The alloy was developed to comply with regulations such as RoHS (Restriction of Hazardous Substances), which restricts the use of lead in electronic products. SAC305 is valued for its reliability in leadfree soldering for a wide range of applications. Its breadth of historical test data due to its adoption as the global standard for lead-free soldering makes it a solid choice for conventional applications. For high reliability, high temperature, or otherwise challenging applications, improved alloys have been developed.

#### **Metallurgy**

Below is a tin-silver-copper ternary phase diagram with silver held constant at 3 wt%. SAC305 has a melting range of 217°C (solidus) to 220°C (liquidus), which is higher than traditional tin-lead solders (183°C) but still sufficiently low for general electronics usage. The addition of 3% silver and 0.5% copper provides the optimal balance of mechanical strength, thermal fatigue resistance, and wetting characteristics in this ternary system. Specifically, the silver and copper form stable intermetallic compounds (IMCs) like Ag3Sn and Cu6Sn5, which remain finely dispersed throughout the solder joint during soldering. These IMCs provide structural reinforcement, enhancing the alloy's thermal and mechanical stability, thereby reducing the risk of joint failure under both thermal cycling and mechanical shock.



### Indalloy<sup>®</sup>256 Properties

Selected Properties	Metric		Imperial	
Liquidus	220	°C	428	°F
Solidus	217	°C	423	°F
Density	7.35	g/cc	_	_
Thermal Conductivity	61	W/mK	-	-
CTE	21	ppm/°C	_	_
Electrical Resistivity	13.2	µ Ohm-cm	_	_
Young's Modulus	6.9	GPa	1,000	ksi
Poisson's Ratio	0.35	_	-	-
Tensile Strength	39.58	MPa	5,740	psi
Yield Strength	22	MPa	3,200	psi
Elongation	49	%	_	_

#### **Available Forms**

Indalloy®256 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**

Form No. 100346 R0

Please refer to the SDS document within the product shipment, or contact our local team to receive a copy.

This product data sheet is provided for general information only. It is not intended, and shall not be construed, to warrant or guarantee the performance of the products described which are sold subject exclusively to written warranties and limitations thereon included in product packaging and invoices. All Indium Corporation's products and solutions are designed to be commercially available unless specifically stated otherwise.

All of Indium Corporation's solder paste and preform manufacturing facilities are IATF 16949:2016 certified Indium Corporation is an ISO 9001:2015 registered company.

## From One Engineer To Another<sup>®</sup>

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