

PRODUCT DATA SHEET

Sn995

Low-Maintenance, Low-Cost, Pb-Free Soldering Alloy

Introduction

Sn995 Low-Maintenance, Low-Cost, Pb-Free Soldering Alloy is a cobalt-doped SnCu alloy that provides a low-cost alternative to traditional SAC305 and a low-maintenance alternative to popular low-Ag lead-free alloys like Sn100C. In addition to its low cost, it produces smoother, shinier joints and lower dross than SAC305 and other SnCu-based alloys.

Features

- Low-maintenance—does not require frequent solder pot analysis or pot balancing alloys
- Low-cost—does not contain Ag
- Low-dross formation—lower than SAC and SnCu-based alloys
- Less copper erosion than SAC305
- Compatible with other SnCu-based alloys (ex. Sn100C)—can be added to existing SnCu-based alloys without any adverse reactions
- Available as a solder bar for wave soldering and cored wire for rework applications

Physical Properties and Process Set-Up

| | Melting Point (°C) | Density | Tensile Strength (MPa) | Topside Preheat (°C) | Pot Temperature (°C) |
|-----------|--------------------|---------|------------------------|----------------------|----------------------|
| Sn995 | 228 | 7.3 | 28 | 110–115 | 260–275 |
| SAC305 | 217–220 | 7.4 | 52 | 110–115 | 260–275 |
| Sn63/Pb37 | 183 | 8.4 | 44 | 85–105 | 250–260 |

Low Dross

Because of Indium Corporation's unique manufacturing process, **Sn995** bar solder exhibits much lower dross than other SnCu-based alloys.

| 260°C | Run Time (hrs) | Dross (g) | Dross Rate |
|--------|----------------|-----------|-------------------|
| Sn995 | 22.28 | 523.3 | 23.49g dross/hour |
| SAC305 | 19.92 | 1,303.5 | 65.44g dross/hour |
| Sn100C | 25.00 | 1,357.6 | 54.3g dross/hour |

Why Cobalt?

There are a number of SnCu alloys doped with minor alloy additives available in the industry today but, unlike cobalt (Co), they all have shortcomings. Also, cobalt is replenished with regular additions of bar; no need for additional additives to maintain the alloy.

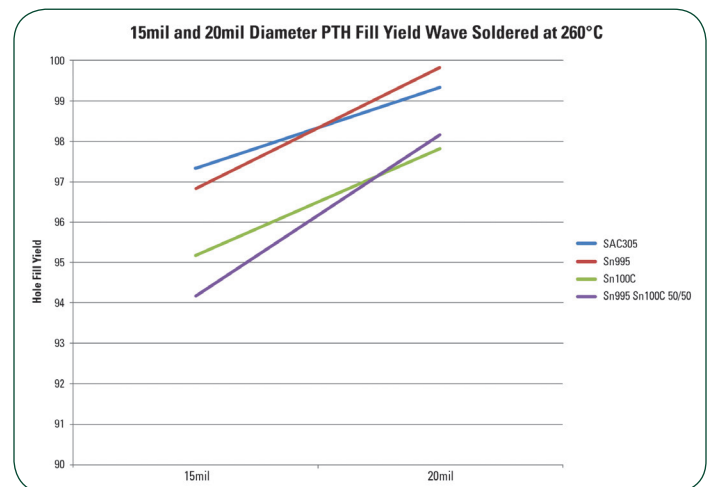
The addition of nickel (Ni) is popular, but Ni has a lower operating limit of 0.035%. Below that percentage, the benefits of Ni are lost. Co has a lower operating limit of 0.003% and a much lower risk of dopant depletion.

Bismuth (Bi) is also commonly used as a dopant; however, numerous studies show that Bi content is related to fillet lifting. This is not a risk when using Co.

Converting from Sn100C to Sn995

A pot dump is not necessary to introduce **Sn995** to the wave soldering process if the current process is using Sn100C. The Sn100C and the **Sn995** are interchangeable alloys. By adding **Sn995** to the Sn100C, the grain refiner in the **Sn995** replaces the grain refiner in the Sn100C as it depletes. There is no change in the solder joint. The fill yield comparison chart shows how introducing **Sn995** to a Sn100C pot will affect the hole fill yields and how that will compare to SAC305.

A pot dump would be necessary for SAC alloys.



From One Engineer To Another®

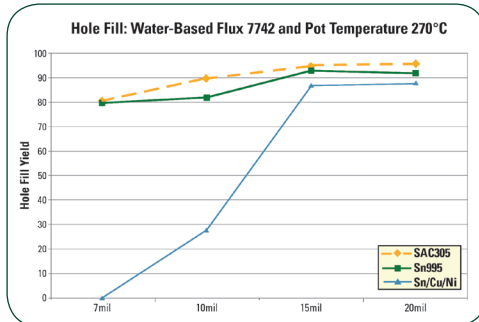
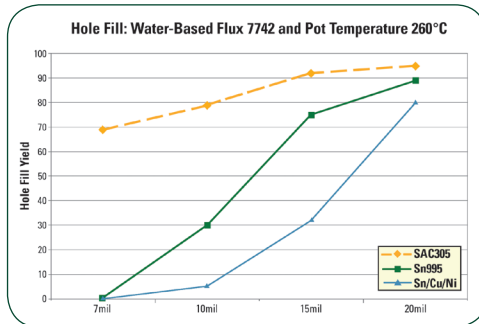
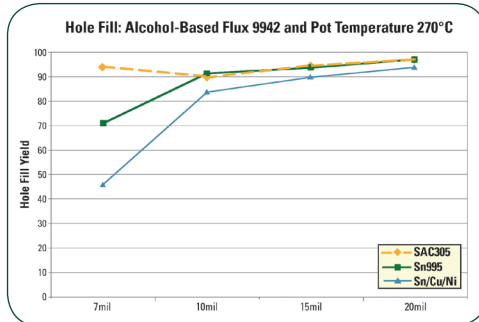
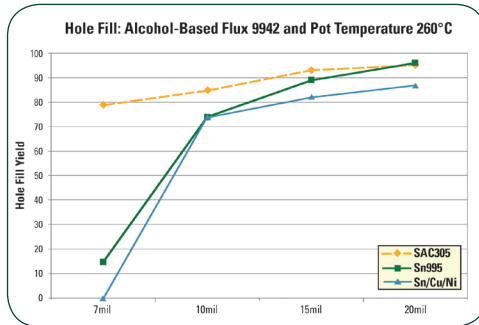


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Hole Fill Performance

Sn995 alloy provides improved hole fill performance when compared to other SnCu-based alloys. Using optimized process conditions and flux materials, the hole fill performance can equal that of SAC305.



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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.

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Quality and Process Control

Each batch of solder alloy used to manufacture Indium Corporation's bar solder and chips is analyzed for metallic composition and impurities. Indium Corporation will certify its bar solder to meet customer specifications with a Certificate of Compliance or provide a Certificate of Analysis upon request.

Solder Analysis

Solder pot analysis is important for maintaining solder joint quality and optimal first-pass soldering yield. By allowing a solder pot to collect too high a level of contaminants from circuit boards and components, the solder can get sluggish, causing overly large fillets, poor wetting, bridging, and expensive rework and repair. Indium Corporation's solder analysis service allows customers to purchase an individual analysis or pre-paid solder analysis mailers in bulk. Contact your Sales Representative or email Indium Corporation at askus@indium.com.

Solder Reclaim

A normal part of a wave soldering process is the creation of solder dross and the occasional dumping of metal-contaminated solder pots. Indium Corporation provides customers with a way to recycle dross and scrap solder, by receiving the materials and returning the metal value to the customer as a check, credit or by converting the usable bar for a fee. To get started with Indium Corporation's solder reclaim program, contact Indium Corporation and we will ship black (Pb-containing) and/or green (Pb-free) dross collection buckets free of charge. Recycling instructions will explain what to do and who to call when you have collected enough dross and scrap solder.

Technical Support

Indium Corporation's internationally experienced engineers provide in-depth technical assistance to our customers. Thoroughly knowledgeable in all facets of Materials Science as it applies to the electronics and semiconductor sectors, Technical Support Engineers provide expert advice in 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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