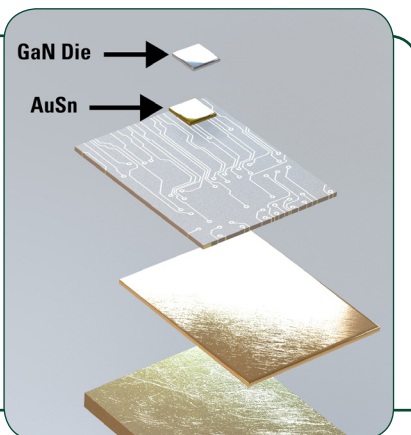


Off-Eutectic AuSn Alloys

for Die-Attach Applications

Introduction

Gallium Nitride (GaN) and other thickly gold plated dies are used in a wide variety of die-attach applications. The thick gold plating works well to prevent oxidation; however, this can cause skewed final solder joint compositions. If an Indalloy®182 (80Au/20Sn) preform—a common solder choice in die-attach applications—were used, the solder material will absorb some of the thick gold plating from the die during reflow. This directly affects the joint strength, as now the joint is no longer that of the eutectic 80Au/20Sn which has high tensile strength properties. By lowering the gold content in the AuSn alloy, there is room for the solder to absorb some of the gold from the plating, and end up with a final joint composition of the eutectic 80Au/20Sn. Our **Off-Eutectic AuSn Alloys** ensure strong solder joints in die-attach applications, improved wetting and voiding, and are currently available in 79Au/21Sn, 78Au/22Sn, and 75Au/25Sn compositions.

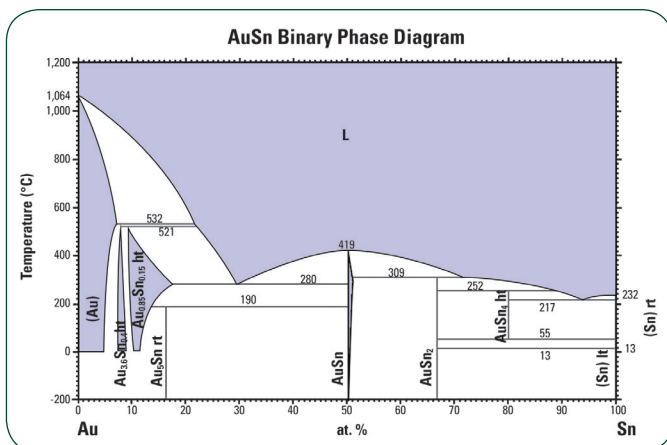


Features

- Available in 79Au/21Sn, 78Au/22Sn, and 75Au/25Sn compositions
- Ensure strong solder joints
- Improved wetting and voiding
- Adjustment of the final solder joint composition

Alloy Chemistry

AuSn has a sensitive eutectic phase, which can be altered by Au-rich metallizations. This can result in areas that do not wet or flow properly, creating a weak solder joint. Adjustments with **Off-Eutectic AuSn Alloy** compositions can be made to accommodate these metallizations, resulting in joint characteristics optimized for high-reliability and performance.



Geometry

Guidelines for preform geometry can be derived from the die size. Generally, 90–100% of the die size will indicate the preform x and y dimensions. As for thickness, our **Off-Eutectic AuSn Alloys** have thickness capabilities down to 0.0005". The most critical attribute for die bonding application is flatness. Due to process constraints, fixturing can be difficult and time consuming. Allowing the die to float freely on the preform can be advantageous. If the preform is not flat, it can skew the die at reflow and fail. Processing is the key to preserving flatness.

Packaging



Packaging in waffle trays is the pack method for many die-attach applications. Tape & reel is another similar pack method that can be used. Both of these methods are used for automated assembly and offer excellent protection for transit and storage. Die-attach preforms can

come in many sizes, so flexibility in design is important. We have an extensive library of trays and tape available.

Summary

Indium Corporation's **Off-Eutectic AuSn Alloys** are an excellent choice for die-attach applications. Using an AuSn preform with a lower gold content allows for absorption of some of a die's thick gold plating, finalizing the solder joint at a composition of 80Au/20Sn, which has high tensile (joint) strength properties. Packaging designed for automated assembly of these preforms ensures repeatable success in a production process.

Safety Data Sheets

The SDS for this product is available by contacting askus@indium.com

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®

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