

Choosing an Alloy

When choosing an alloy for your application, you need to consider:

1. Final assembly operating conditions (temperature and stresses):

- To eliminate thermal failure (melting of joint), alloy softening point (solidus) should be 40–50°C above operating temperature.
- Mechanical stresses induced by temperature fluctuations must be matched by alloy compliance (thermal fatigue resistance).
- Hostile environments, such as salt or swamp conditions, may require corrosion-resistant alloys.

2. Surface metallization (alloy compatibility):

- The alloy must wet to surfaces while not scavenging (dissolving) excessive surface metal or forming brittle intermetallics.
- Typical surface metal is gold (Au) over Nickel (Ni). Gold thickness is generally recommended to range between 8–15 microinches (2,000–4,000 angstroms; 0.00020–0.00038mm). If Au thickness is greater than 8–15 microinches, a non-Sn-bearing alloy may be needed to avoid brittle AuSn intermetallics.

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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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3. Assembly conditions and methods:

- Most alloys will form a solder joint best at temperatures 20–40°C above the alloy's liquidus point. Consequently, the peak temperature limitations of components must be considered.
- Heating methods could impact alloy choice; for example, a fluxless process with no reducing atmosphere may require an alloy that has a low oxide formation, such as 80Au20Sn.



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