



# Pb-Free SERIES SOLDER PASTE

## Specialized formulations for enhanced performance focus:

Indium8.9	Indium8.9HF	Indium8.9HF-1	Indium8.9HFA	Indium10.1
<b>8.9 Solder Paste Eliminates HIP</b> <ul style="list-style-type: none"> <li>Strong oxidation barrier to promote coalescence after heat exposure</li> <li>High tackiness to maintain contact with components</li> <li>Clear probe-testable flux residue</li> </ul>	<b>8.9HF Solder Paste Best All-around Halogen-free Paste</b> <ul style="list-style-type: none"> <li>Strong oxidation barrier promotes complete coalescence</li> <li>Resists premature flux spread to prevent surfaces from oxidizing</li> <li>Probe testable</li> <li>Halogen-free</li> </ul>	<b>8.9HF-1 Solder Paste Enables In-circuit Probe Testing</b> <ul style="list-style-type: none"> <li>Thermally stable residue designed to stay probe-testable</li> <li>Fewer false testing failures mean quicker cycle times and less rework</li> <li>Halogen-free</li> </ul>	<b>8.9HFA Solder Paste Delivers Superior Printing for Miniaturization</b> <ul style="list-style-type: none"> <li>Best-in-class high speed printing</li> <li>Optimal print performance for the smallest components and apertures</li> <li>Halogen-free</li> </ul>	<b>10.1 Solder Paste Best All-around Halogen-containing Paste</b> <ul style="list-style-type: none"> <li>Lowest levels of voiding for QFNs, BGAs, and CSPs</li> <li>Oxidation inhibition promotes complete coalescence after long reflow profiles</li> <li>Excellent HIP, graping performance</li> </ul>

### Ideal for miniaturized components and fine-pitch assembly

- Designed especially for CSP, 0201, and 01005 components

### First-class printing performance

- Excellent print transfer through minute apertures with area ratios <0.66
- Long stencil life and forgiving response-to-pause
- High component retention tack prevents components from shifting

### Robust reflow performance

- Wide process window for flexible reflow profiling
- Optimal wetting to all common surface finishes

### Resists voiding

- Low voiding (typically <5%) for BGAs with via-in-pad technology
- Low QFN voiding



# FEATURED **Pb-Free** ALLOYS

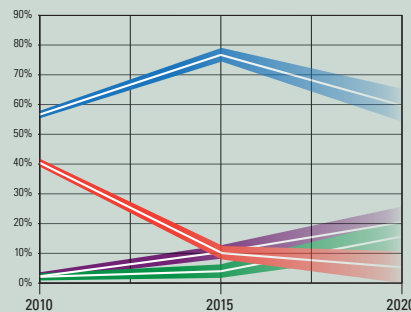
## Pb-Free Alloys for Solder Paste

Common Name	Composition	Solidus (°C)	Liquidus (°C)	Comments
InSn	52.0In/48.0Sn	118 (eutectic)		Lowest melting point practical solder
BiSn	58.0Bi/42.0Sn	138 (eutectic)		Good thermal fatigue performance; established history
BiSnAg	57.0Bi/42.0Sn/1.0Ag	139	140	Ag addition makes this alloy less brittle than BiSn
Indalloy®227	77.2Sn/20.0In/2.8Ag	175	187	Not for use over 100°C due to 118°C SnIn eutectic
SnInCe	87.0Sn/13.0In+Ce	190	205	Best-in-class thermal cycling performance due to high ductility; addresses high CTE mismatches
Indalloy®254	86.9Sn/10In/3.1Ag	204	205	No SnIn eutectic problems; potential uses for flip-chip assembly
SnBiAg	91.8Sn/4.8Bi/3.4Ag	211	213	Board and component metallizations must be Pb-free
SAC405	95.5Sn/4.0Ag/0.5Cu	217	218	Favored alloy for enhanced thermal reliability over SAC alloys with less Ag
SAC387	96.5Sn/3.8Ag/0.7Cu	217	219	Original iNEMI recommended SAC alloy
SAC305	96.6Sn/3.0Ag/0.5Cu	217	220	Recommended SAC alloy by the Solder Products Value Council
SAC105	98.5Sn/1.0Ag/0.5Cu	217	225	Low-cost alloy with reasonable thermal reliability
SACM™	98.5Sn/0.5Ag/1.0Cu+Mn	217	225	Drop test performance as good as SnPb
SAC0307	99.0Sn/0.3Ag/0.7Cu	217	227	Low-cost SAC alloy
SnCu	99.3Sn/0.7Cu	227 (eutectic)		Inexpensive; possible use in wave soldering
Sn992	99.2Sn/0.5Cu+Bi+Co	227		High-performance and low-cost solder alloy
"J" alloy	65.0Sn/25.0Ag/10.0Sb	223 (eutectic)		Die-attach solder alloy; very brittle
Indalloy®133	95.0Sn/5.0Sb	235	240	High-temperature Pb-free alloy
Indalloy®259	90.0Sn/10.0Sb	250	272	High-temperature Pb-free alloy

For more information about alloys we have available, please visit: [www.indium.com/solder-alloy-guide](http://www.indium.com/solder-alloy-guide)

## Recommended Alternatives to SAC305

High Reliability	Low Cost	Low Melting Point
<ul style="list-style-type: none"> <li>• SAC405</li> <li>• SACM™</li> <li>• SnInCe</li> </ul>	<ul style="list-style-type: none"> <li>• Sn992</li> <li>• SAC105</li> <li>• SAC0307</li> </ul>	<ul style="list-style-type: none"> <li>• BiSn</li> <li>• BiSnAg</li> <li>• InSn</li> </ul>



**Pb-Free Alloy Transition**

**From One Engineer To Another®**

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