

# Pb-Free Solder Paste Series



Indium8.9HF	Indium8.9HF-1	Indium8.9HFA	Indium10.1	Indium10.1HF	Indium10.8HF	Indium11.8HF-SPR
<b>Comprehensive Halogen-Free Industry All-Star</b>	<b>Enables In-Circuit Probe Testing</b>	<b>Enables Fast Printing</b>	<b>Comprehensive Halogen-Containing Industry All-Star</b>	<b>Ultra-Low BTC Voiding</b>	<b>Non-Wet Open Mitigation</b>	<b>Type 5-MC for Mobile Communication</b>
<ul style="list-style-type: none"> <li>Versatile processing window</li> <li>Low-voiding</li> <li>Strong oxidation barrier promotes complete coalescence</li> <li>Long shelf life and stencil life</li> <li>Halogen-free</li> </ul>	<ul style="list-style-type: none"> <li>Fewer false testing failures means quicker cycle times and less rework</li> <li>Highest first-pass yields in ICT due to soft flux residue</li> <li>Low-voiding at lower reflow temperatures</li> <li>Halogen-free</li> </ul>	<ul style="list-style-type: none"> <li>Best-in-class high-speed printing transfer efficiency</li> <li>Low squeegee wiping pressure</li> <li>Excellent wetting and spread to aged and fresh surface finishes</li> <li>Halogen-free</li> </ul>	<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 and graping performance</li> </ul>	<ul style="list-style-type: none"> <li>Ultra-low BTC voiding</li> <li>High ECM performance under low standoff components</li> <li>Outstanding solder beading performance</li> <li>Halogen-free</li> </ul>	<ul style="list-style-type: none"> <li>Excellent NWO performance</li> <li>Mitigates graping</li> <li>Excellent wetting to aged and fresh surface finishes</li> <li>Halogen-free</li> </ul>	<ul style="list-style-type: none"> <li>High transfer efficiency through small apertures (<math>\leq 0.66AR</math>)</li> <li>Eliminates hot and cold slump to inhibit bridging and solder beading defects</li> <li>Unique oxidation barrier to eliminate HIP and graping performance</li> <li>Halogen-free</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

Contact our engineers: [askus@indium.com](mailto:askus@indium.com)

Learn more: [www.indium.com](http://www.indium.com)

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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.*



# Featured Pb-Free ALLOYS

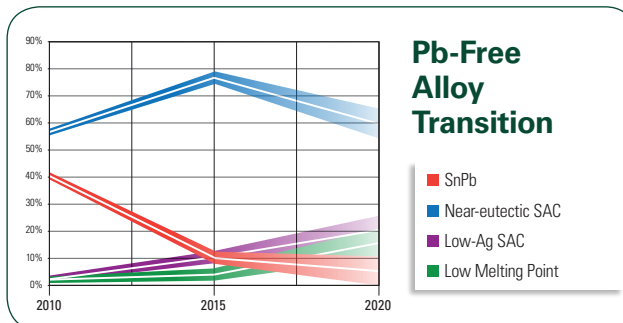
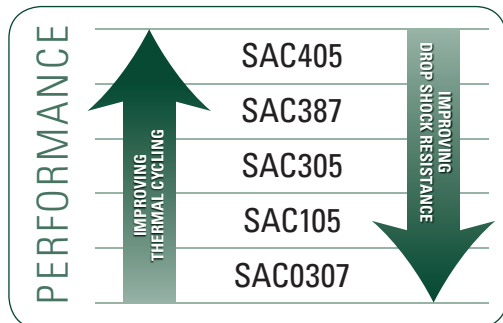
## Pb-Free Alloys for Solder Paste

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
Indalloy®254	86.9Sn/10.0In/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	95.5Sn/3.8Ag/0.7Cu	217	219	Original iNEMI recommended SAC alloy
SAC305	96.5Sn/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> </ul>	<ul style="list-style-type: none"> <li>Sn992</li> <li>SAC105</li> <li>SAC0307</li> <li>SACm®</li> </ul>	<ul style="list-style-type: none"> <li>BiSn</li> <li>BiSnAg</li> <li>InSn</li> <li>Durafuse™ LT</li> </ul>



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