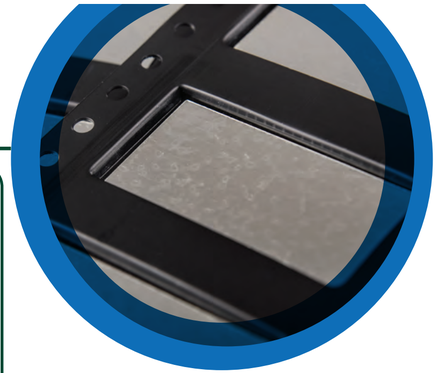
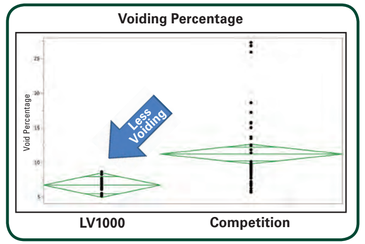
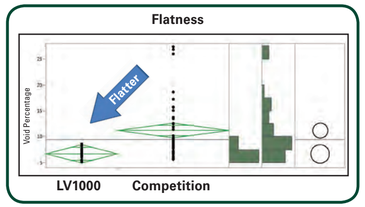
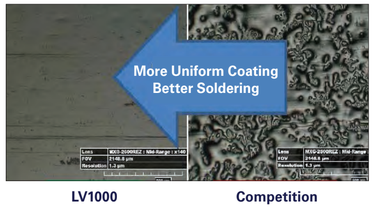
LV1000
FLUX-COATED PREFORMS









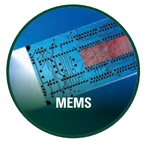
DIE-ATTACH ALLOYS
ULTRA-HIGH PURITY

Common Name	Composition	Solidus (°C)	Liquidus (°C)
Sn63	63.0Sn/37.0Pb	183 (eutectic)	
SAC105	98.5Sn/1.0Ag/0.5Cu	217	225
SACm™	98.5Sn/0.5Ag/1.0Cu+Mn	217	225
Indalloy®241	95.5Sn/3.8Ag/0.7Cu	220	217
Indalloy®256	96.5Sn/3.0Ag/0.5Cu	220	217
Indalloy®121	96.5Sn/3.5Ag	221 (eutectic)	
"J" alloy	65.0Sn/25.0Ag/10.0Sb	223 (eutectic)	
SnCu	99.3Sn/0.7Cu	227 (eutectic)	
Sn992	99.2Sn/0.5Cu+Bi+Co	227 (eutectic)	
Indalloy®133	95.0Sn/5.0Sb	240	235
Indalloy®259	90.0Sn/10.0Sb	250	272
Indalloy®182	80.0Au/20.0Sn	280 (eutectic)	
Indalloy®228	88.0Pb/10.0Sn/2.0Ag	290	267
Indalloy®151	92.5Pb/5.0Sn/2.5Ag	296	287
Indalloy®159	90.0Pb/10.0Sn	302	275
Indalloy®163	95.5Pb/2.5Ag/2.0Sn	304	299
Indalloy®171	95.0Pb/5.0Sn	312	308

INDIUM CORPORATION
WORLDWIDE

Our Goal
Increase our customers' productivity and profitability through the design, application, and service of advanced materials.

Markets Served



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- Cutting-edge material research and development
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- Lowest cost of ownership

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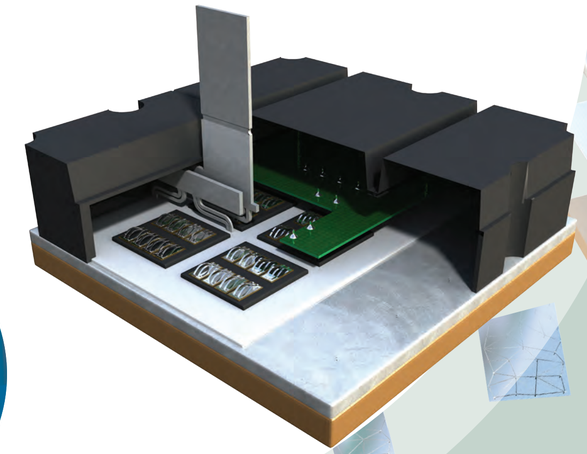
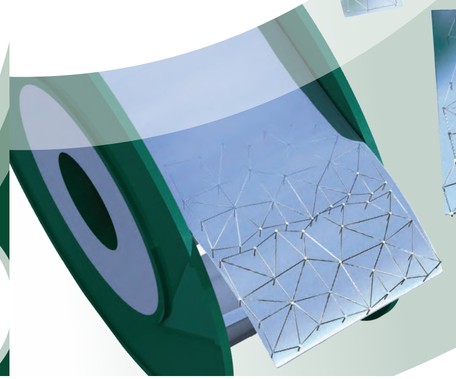
Form No. 99049 (A4) R5

SOLDERS AND THERMAL INTERFACE MATERIALS FOR
IGBT ASSEMBLY

Indium Corporation is the leader in Solders for Power Electronics.





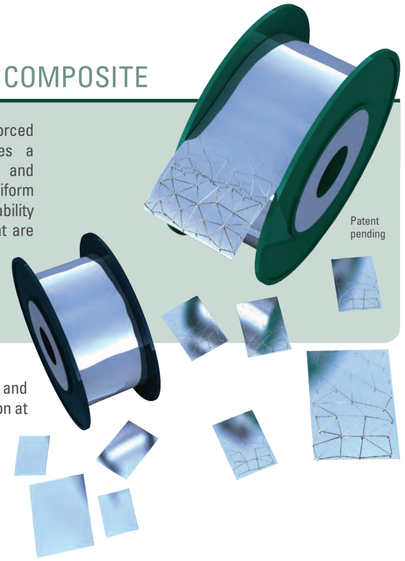
INDIUM® CORPORATION®

InFORMS®

REINFORCED MATRIXED SOLDER COMPOSITE

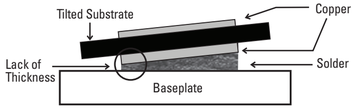
InFORMS® preforms and patent-pending ribbon are reinforced matrixed solder composites. This process produces a reinforced solder fabrication with improved strength and creates a more consistent bondline thickness. A uniform bondline maximizes the thermal and mechanical reliability in the solder joint, therefore producing solder joints that are higher in reliability.

InFORMS® can be manufactured into a wide variety of shapes, including rectangles, discs, and custom shapes to suit specific application requirements.

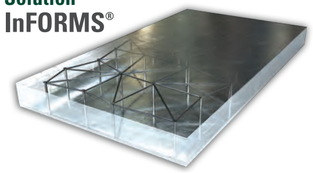


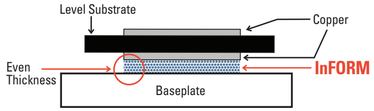
Challenge

Uneven solder bondline thickness between the substrate and baseplate of an IGBT module causes stress concentration at the thinner sections as shown here:



Solution InFORMS®





Semiconductor-Grade Solder Alloys

- High-purity
- Custom alloys

Automated Assembly

- Tape & reel
- Waffle/tray pack
- Ribbon

Dimensional Specifications

InFORMS® can be manufactured to meet most standard preform configurations. The geometrical tolerances are not affected by the composite within the solder. The table below lists the standard configurations offered.

Standard Configurations

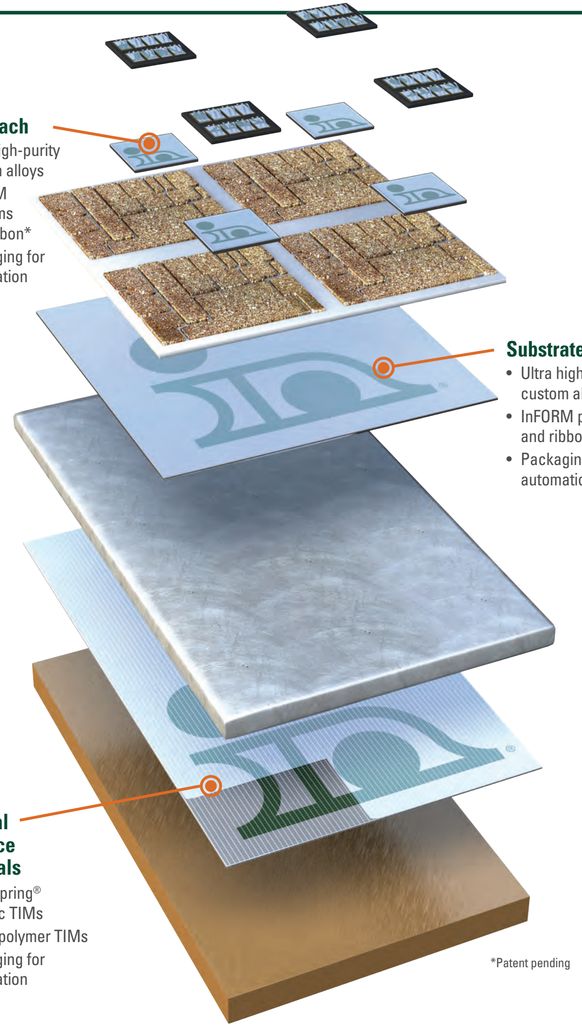
Solder Preform Requirements			
Description	Standoff (Microns)	Part Dimensions (x and y) (Millimeters)	Part Dimensions (z) (Microns)
LM04	100	>10 per side	>150
LM06	150	>10 per side	>200
LM08	200	>10 per side	>250
SM04	100	2.5–10 per side	>150
ESM03	75	.75–2.5 per side	>125

Summary

InFORMS® are solder preforms or ribbon with a reinforcing matrix that improves the strength of the solder material and provides dependable standoff heights. This combination of benefits imparts the reliability and performance in many electrical components.

IGBT

SOLDER AND THERMAL SOLUTIONS



Die-Attach

- Ultra high-purity custom alloys
- InFORM preforms and ribbon*
- Packaging for automation

Substrate Attach

- Ultra high-purity custom alloys
- InFORM preforms and ribbon*
- Packaging for automation

Thermal Interface Materials

- Heat-Spring® metallic TIMs
- HSMF polymer TIMs
- Packaging for automation

*Patent pending

HEAT-SPRING®

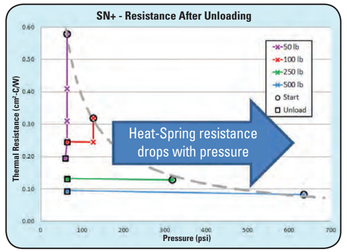
THERMAL INTERFACE MATERIAL

Metal Solution

HSHP Sn+

Metallic Sn-based TIM with a dopant that offers:

- 1,500psi tensile strength
- 73W/mK thermal conductivity
- Superior thermal cycling survivability



Sn+

Low-Flow Stress Material

Example of Tear

High-Flow Stress Material

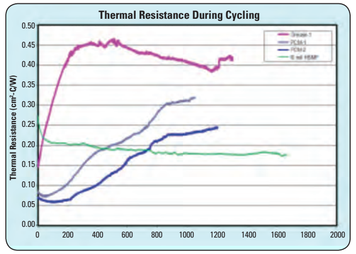
No Tear/No Break

Polymer Solution

HSMF

- Non-silicon based polymer
- Resists pump-out and bake-out
- Up to 10mils in thickness
- Performs better over time
- Adhesive properties for ease of assembly
- As cost effective as grease

Pressure	10psi minimum to 500psi
Max operating temp	175°C
Thickness	100, 150, and 250 microns



	Temperature Profile Exposure			
Application Pressure: 50N/sqin	Ambient	125°C	150°C	175°C
Average Delamination Force (N)	58.6	76.3	62.6	56.8

	Temperature Profile Exposure			
Application Pressure: 100N/sqin	Ambient	125°C	150°C	175°C
Average Delamination Force (N)	92.6	92.8	107.6	90.0

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