

PRODUCT DATA SHEET

# Indium Thermal Interface Materials (TIM)

## Introduction

**Thermal interface materials** are useful for a variety of applications, but solder thermal interface materials (sTIM) are especially suited to high-end device cooling. To improve package reliability, it is especially important to choose the right alloy. Indium, in particular, should be considered as a sTIM because of its high thermal conductivity, compressibility (SMA-TIM), and ease of application.

## Specifications

Max. Operational Temp.	125°C
Standard Purity Level	99.99%
Typical Size	25.4mm x 25.4mm x .05-.3mm (1" x 1" x .002"-.012")

## Applications

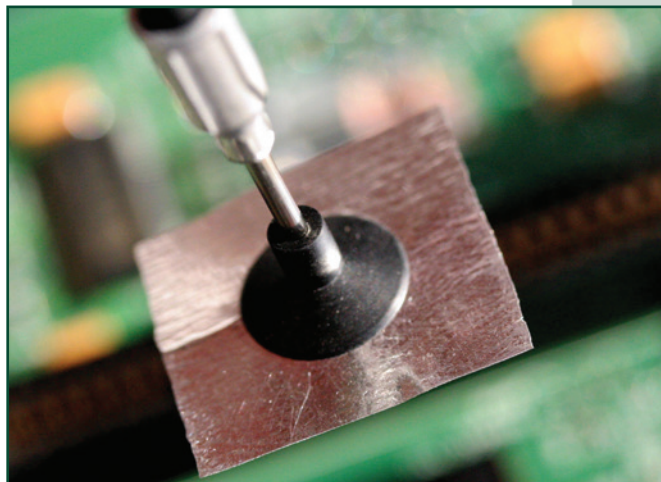
Indium Preforms may be used in a variety of processes.

- Compressed Between Two Surfaces Without Reflow (SMA-TIM) Soft Metal Alloy-TIM**  
 The extreme malleability of indium allows it to minimize surface resistance – thereby increasing heat flow. The graph below demonstrates this phenomenon.
- Soldered Between Two Surfaces (sTIM) Solder-TIM**  
 Used to further improve thermal resistance, this application may require the use of a flux to reduce oxides on soldering surfaces.
- Cold-Welding**  
 Another process that is used to create a thermal interface involves reflowing indium preforms onto each solderable surface. The indium-coated surfaces should be cleaned and pressed together to form a fluxless cold-weld solder joint. (See the Application Note: *Etching Indium to Remove Oxides* for more information about this process.)

## Storage and Packaging

Solder Preforms come in a variety of packaging options, including tape and reel. To minimize excessive handling, and exposure to air and subsequent oxidation, Solder Preforms should be packaged according to the quantity used during a typical work shift.

Store Solder Preforms in the original container, closed securely, in 55% RH or less and at temperatures less than 22°C. Solder Preforms can also be stored in an inert atmosphere, such as a nitrogen dry box.



## Properties

Indalloy	#4
Electrical Conductivity (% of IACS) (1.72microhms-cm)	24
Thermal Conductivity (W/cm °C) (@ 85°C)	.86
Coefficient of Thermal Expansion (µin/µin per °C) (@20°C)	29
Density (lb/cu. in.)	.2641
Mass Density (gm/cm <sup>3</sup> )	7.31
Tensile Strength (PSI)	273
Shear Strength (PSI)	890
Young's Modulus (PSI X 10x6)	1.57
%Elongation	22 to 41
Brinell Hardness (2mm ball, 4kg load)	0.9
Latent Heat of Fusion (J/g)	28.47
Melting Point (°C)	156.7

*All information is for reference only. Not to be used as incoming product specifications.*

## Safety Data Sheets

The SDS for this product can be found online at <http://www.indium.com/sds>

Application Notes on the use of Thermal Interface Materials can be found at <http://www.indium.com/techlibrary/applicationnotes.php> or email [TIM@indium.com](mailto:TIM@indium.com).

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