PRODUCT DATA SHEET

Gallium-Based Liquid Metal Alloys

as Thermal Interface Materials

Introduction to Gallium and LMAs

Gallium (Ga) is a non-toxic metal that melts at 30°C. **Gallium** is the basis for lower melting liquid metal alloys (LMAs) with metals such as tin (Sn), indium (In), zinc (Zn), and many others. LMAs are often used as replacements for toxic mercury (Hg) in many applications, but they are increasingly being used in advanced large area thermal interface applications that require a low thermal resistance and a very low Young's Modulus/viscosity.

Indium Corporation as a Supplier of LMAs

Indium Corporation is recognized by our large semiconductor and electronics industry customers as a reliable supply chain partner. Indium Corporation has been supplying household-name electronics customers with gallium-based liquid metals in the thermal interface materials (TIMs) market for over 20 years, and has supplied gallium-based materials into much wider markets for almost 60 years. We also supply gallium and other metals from Americas- and Asia-based sources, ensuring a continuous, high-volume LMA supply for any location.

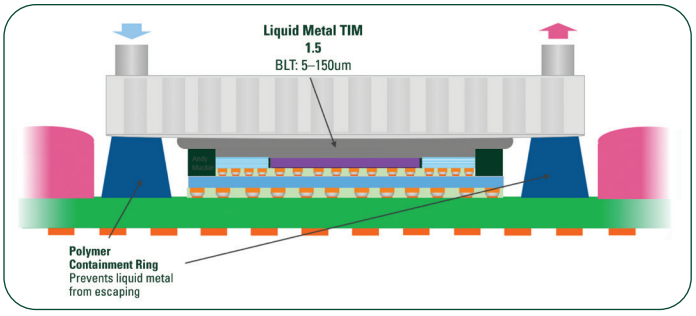
Our extensive experience and direct engagement with both customers and equipment suppliers has enhanced our reputation as world-renowned gallium and liquid metal technical experts, guiding customers to the best LMA type, grade, packaging, shipping, and application method.

Our four thermal R&D, test, and customer demonstration laboratories around the globe enable us to partner with customers in developing, testing, and optimizing gallium-based materials, according to customer needs.

Indium Corporation is also engaged globally with start-ups, universities, and industry consortia on a variety of gallium-based technologies and welcomes enquiries about such engagements.

Applying Liquid Metals

Liquid metals used as TIMs may be applied in one of several ways.



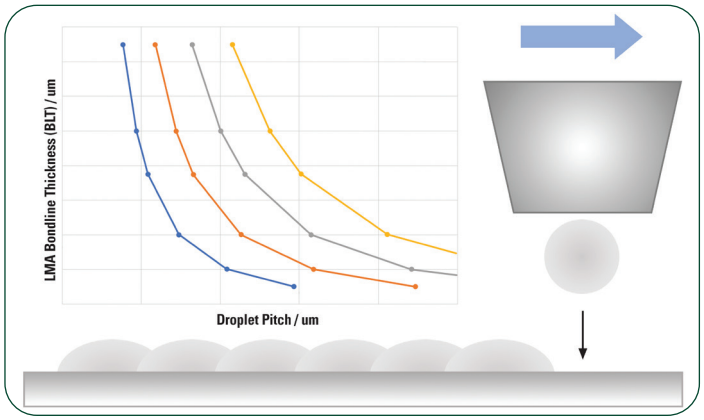
The primary application method must involve surface preparation to remove organic films, followed by jetting the LMA onto the surface. The momentum of the controlled jetted liquid forces the LMA droplet to wet onto marginally-wettable surfaces, such as native silicon oxide (on bare silicon) or nickel (often used as a barrier for copper heat-sinks).

Other deposition methods have been developed over the years, but our experience with global liquid metal and thermal customers, in partnership with jetting equipment manufacturers, leads us to believe that jetting is the preferred application method.

General guidelines from LMA jetting are given below; a more comprehensive guide is also available.

Key variables:

- Droplet size and spacing
- Target film / bondline thickness
- Temperature
- Oxidation over time

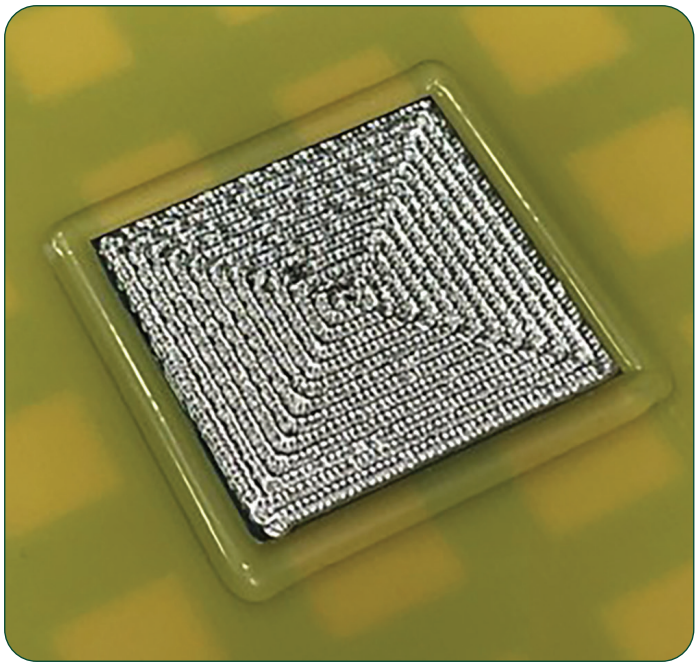


From One Engineer To Another®

INDIUM® CORPORATION®

PRODUCT DATA SHEET

Liquid Metal Gallium and Gallium Alloys



The standard LMA Indalloy® options used in thermal (TIMs) applications are shown in the table below.

Indalloy® Number	Applications for Ga-Based LMA TIM	Solidus (°C)	Liquidus (°C)	Therm Cond (k) @ 85°C / W/mK	Density / g/cm³
306	Industry standard in HPC, AI server, and high-end gaming platforms	10	19	37	6.44
300E	Highest bulk thermal conductivity (Therm Cond, k) and are best for jetting applications	15.7		44	6.16
51E	Lower melting point eutectic alloy used in dispensing and printing TIM applications	11		37	6.32

Other Liquid Metal Alloys available upon request. Please contact Indium Corporation to discuss your specific needs. All Indium Corporation liquid metal alloys are RoHS-compliant.

Packaging

Standard syringe sizes and packaging quantities are as follows:

- 3cc - 10 grams
- 5cc - 20 grams
- 10cc - 40 grams
- 30cc - 100 grams

Larger customers have requested novel packaging for LMAs, and our Technical Support Engineers have new innovations under development.

Transportation and Shelf Life

Shelf life of LMAs is nominally one year at room temperature in original packaging and overpack. Liquid metal from Indium Corporation is packaged to minimize headspaces and limit the exposure of freshly-created metal surfaces to air. Avoid dropping or otherwise physically shocking the liquid metal packaging or overpack.

Freeze/thaw cycles should also be minimized, as the change in density at the freeze/thaw temperature will lead to increased surface oxidation. Shipments may also be shipped refrigerated to minimize freeze/thaw cycles. Liquid metal longevity is increased by minimizing moving/shaking the packaged liquid metal, and storing in a low-humidity environment (<40%RH).

All LMA shipments from Indium Corporation's facilities are compliant with international shipping regulations. Indium Corporation's packaging of LMAs is certified UN-compliant. All such shipments comply with International Air Transport Association (IATA), International Maritime Dangerous Goods (IMDG) regulations, and the U.S. Department of Transportation.

Technical Support

Indium Corporation's internationally experienced engineers provide in-depth technical assistance to our customers. Thoroughly knowledgeable in all facets of Materials Science as it applies to the electronics and semiconductor sectors, Technical Support Engineers provide expert advice in solder properties, alloy compatibility and selection of solder preforms, wire, ribbon, and paste. Indium Corporation's Technical Support Engineers provide rapid response to all technical inquiries.

Safety Data Sheets

Please refer to the SDS document within the product shipment, or contact our local team to receive a copy.

This product data sheet is provided for general information only. It is not intended, and shall not be construed, to warrant or guarantee the performance of the products described which are sold subject exclusively to written warranties and limitations thereon included in product packaging and invoices. All Indium Corporation's products and solutions are designed to be commercially available unless specifically stated otherwise.

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.

Contact our engineers: askus@indium.com
Learn more: www.indium.com

ASIA +65 6268 8678 • CHINA +86 (0) 512 628 34900 • EUROPE +44 (0) 1908 580400 • USA +1 315 853 4900

INDIUM CORPORATION®

©2026 Indium Corporation