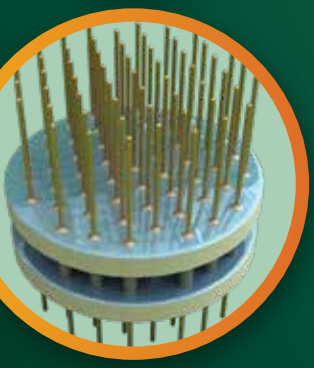
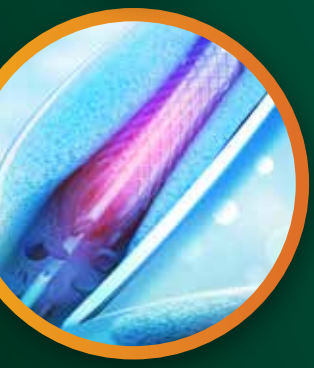
SOLDERING FOR
Medical Devices and Electronics

Technological advancements and longer lifespans are driving growth in the global medical device and electronics manufacturing markets.



Indium Corporation prioritizes supplier flexibility, design support, and prototype quantities to bring your ideas to life efficiently with high-quality products, reliability, and on-time delivery.



INDIUM® CORPORATION®

SOLDERING FOR
Medical Devices and Elect

Medical Device Assembly

The assembly of medical devices (such as catheters, guide wires, Nitinol stents, etc.) uses a wide variety of alternative soldering processes that require non-standard soldering products.

Catheter and feed-through assemblies

- The assembly of diagnostic and therapeutic catheters, micro-catheters, and feed-throughs requires precision solder products that are made to tight tolerances and high-quality standards.

Optics

- Sealing optics into devices, such as endoscopes, requires the use of a fluxless process and materials.

Hermetic sealing

- A hermetic seal is often required to ensure that delicate components are not exposed to harsh environments.
- Gold-tin, because of its reliability and resistance to metallic oxide formation, makes it ideal for a fluxless process.
- Indium can be used for hermetic, vacuum, and cryogenic seals because it is malleable and ductile, even at extremely low temperatures.

Implantable devices including sensors

- Temperature-sensitive devices may need low-melting alloys to prevent thermal stress during assembly.

Soldering to medical alloys

- Soldering to some of the most widely used metals in the medical market, including Nitinol and stainless steel, can be challenging.
- Removal of the tenacious surface metal oxides must be achieved before soldering can take place.

Connector manufacture

- Maximum signal integrity is required to allow for the optimum flow of data and images.

Electronics Assembly

From diagnostic and imaging equipment to hand-held monitoring devices, printed circuit boards are in almost all of the equipment used by doctors, hospitals, and clinics.

- Smaller components in smaller devices require solder materials that provide good electrical contacts with no bridging, excellent wetting, and good throughput.
- Connectors need to be securely soldered to the circuit board to withstand constant use.
- In order to achieve maximum functionality in increasingly smaller spaces, the use of flexible circuit boards is increasing, providing new challenges for electronics assembly.

Product Characteristics

Solder Paste

- Spherical, low-oxide powder available in various mesh sizes
- Pb-free, Pb-containing, AuSn, and indium-containing alloys
- No-clean, water- or solvent-cleanable flux vehicles
- Flexible packaging and quantities to support manufacturing requirements

Solder Wire

- Diameters available in SnAg and AuSn down to 0.001"
- Pb-free, Pb-containing, AuSn, and indium-containing alloys
- Solid cored and flux cored

Solder Preforms

- A large die library of washers, squares, discs, frames, and special shapes
- Pb-free, Pb-containing, AuSn, and indium-containing alloys
- Flux coatings
- Small sizes, variable thicknesses to achieve optimum solder volume
- Flexible packaging and quantities to support manufacturing requirements

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Soldering Process	Description	Challenges	Our Recommended Products
Surface Mount Reflow	Standard process for PCB assembly	Flexible circuits and smaller boards and components require no bridging; provide excellent wetting	• Indium8.9HF Solder Paste for the reflow temperatures needed by SAC and SnPb • Solder Fortification® Preforms
Laser Soldering	Non-contact; highly controlled heating	Identifying the proper power and timing to reduce voiding and flux spatter, and optimize wetting	• Indium509L and Indium510L • Solder Preforms, especially washers for pin soldering • Solder Spheres
IR Soldering	Can be used for smaller packages, such as chip resistors, capacitors and SOICs, and high-temperature soldering	Larger components may impede heating of smaller components due to shadowing effect	• Solder Preforms • Solder Spheres • Indium8.9HF Solder Paste for SAC and SnPb
Induction Soldering	Localized, uniform heating	Requires proper setup and design with a repeatable process to introduce the parts being soldered	• Solder Preforms • Solder Spheres • Solder Wire • Solder Ribbon
Vacuum Soldering	Reduction in pressure allows voids in solder to escape prior to reflow, creating much lower voiding in finished solder joint	Batch process may be too slow for high-volume manufacturing Requires proper setup, design, and material selection	• Solder Preforms (especially AuSn) • Solder Spheres • Indium8.9HF Solder Paste for SAC and SnPb
Vapor Phase Soldering	Vapor chamber allows for uniform heating across the entire assembly	Fast wetting forces may cause tombstoning with common chip and resistors, which can be minimized with preheat	• Standard Solder Preforms • NC-SMQ230 Solder Paste • Indium8.9HF Solder Paste for SAC and SnPb
Manual Soldering	Heat gun, soldering iron, or other hand-held heat source reflows the solder	Operator-to-operator solder volume variance	• Flux-Cored Wire • Solid Cored Wire • Solder Preforms

Solder Spheres

- Alloys: SAC and Pb-containing alloys, as well as indium-containing
- Standard sizes are 300–1,270 microns; other sizes may be available upon request
- Tolerances as tight as ±5 microns for uniform alignment

Fluxes

- Flux #2 for removing tenacious oxides from metals, such as Nitinol and stainless steel
- No-clean and water-soluble TACFlux®

Additional Information

To discuss your specific application, contact us at **medical@indium.com**.

For more information, the following Product Data Sheets and Application Notes are available at **indium.com.**

Product Data Sheets:

- Eutectic AuSn Solder
- Flux-Coated Preforms
- Indalloy® Flux #2
- Indium8.9HF No-Clean Solder Paste
- Indium509L Solder Paste
- Indium510L Solder Paste
- NC-SMQ230 Solder Paste
- Precision Spheres
- Solder Preforms
- Solder Wire

Application Notes:

- Flux and Solder Compatibility
- Indium for Sealing
- Pb-Free Solder Preforms
- Solder Pastes Used in Vapor Phase Soldering
- Soldering to Nitinol
- Using Flux-Coated Preforms in Soldering

Indium Corporation

Our Goal

Increase our customers' productivity and profitability through premium design, application, and service using advanced materials.

Our Basis for Success

- Excellent product quality and performance
- Superior extensive product range
- Lowest cost of ownership

Business Segments

- Electronics assembly materials
- Engineered solders and alloys
- Metals and compounds
- Nanotechnology
- Semiconductor assembly materials
- Thermal interface materials

Corporate Quality Policy

- Provide quality products that meet or exceed customer needs, expectations, and requirements
- Create an organizational culture that focuses on meeting requirements and continuous improvement
- Have products that are compliant with relevant laws and regulations
- Focus on defect prevention
- Respond to input from external and internal customers
- Identify and provide necessary resources

Commitment to Sustainability

Indium Corporation recognizes that environmental responsibility is important to the sustainability of our business, our products, our brand, and our place in the community. As we pursue improvements in our business practices, we will remain mindful of the impact we have on the global environment.

Global Technical Support and Facilities Worldwide

Contact our engineers: **askus@indium.com**

Learn more: **www.indium.com** or **www.indiumchina.cn**

From One Engineer To Another®

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.

Form No. 98603 (A4) R4

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