

APPLICATION NOTE

Handling of Indium-Contained Preforms

Indium Engineered Materials

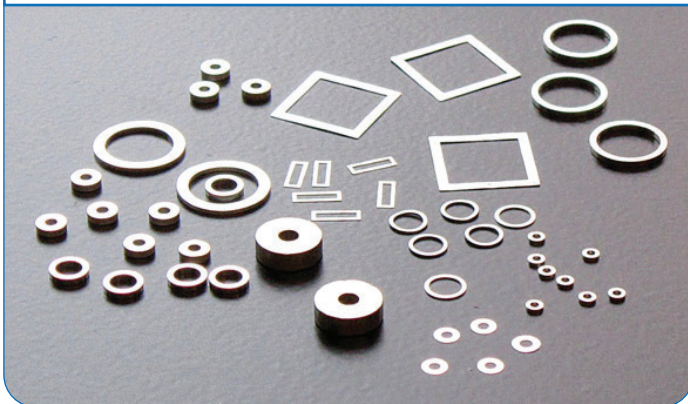
Indium metal has played a key role in technology advances since it was first investigated by Dr. William S. Murray in 1924 in Utica, NY, and with the creation of the Indium Corporation in 1934, the two have been tied together leading and supporting the advancement of technologies that we all rely on today.

Indium metal is extracted primarily from indium-bearing zinc or tin ores and purified to various grades utilizing state-of-the-art statistical process-controlled refining technologies.

Indium Corporation produces and refines indium in the USA, Korea, and China.

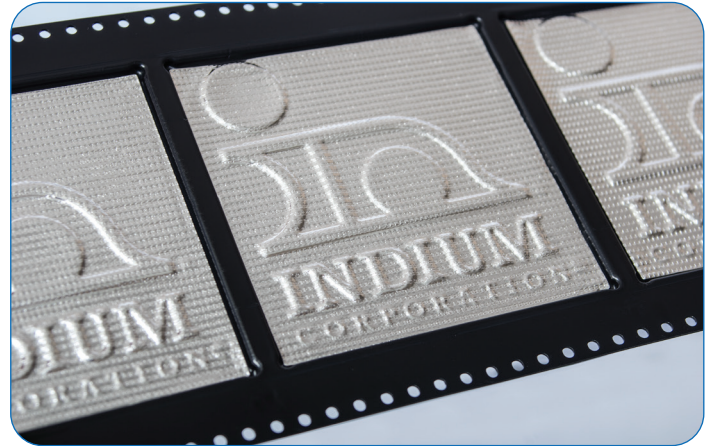
According to the U.S. Geological Survey statistics, the worldwide output of indium metal has increased 7X since 1980. We believe that this trend will continue and supply will expand to meet demand.

The indium supply has been bolstered by continued improvement in recycling programs. In the rapidly growing LCD market, greater than 85% of non-deposited indium is reclaimed and returned to the supply chain.



Handling of Indium-Contained Preforms, Wire or Ribbon

Indium is a very soft metal and should be handled with care to maintain the original shape of the product. Indium's low tensile strength will cause a product like wire to stretch if it is pulled off a spool. Oils from skin can impact the function of an indium part so care should be taken to use gloves or tweezers when handling individual parts.



Safety Precautions

Contact with and use of a solid metal article of indium for the original intended application is not hazardous. Always wear safety glasses and gloves and other PPE when handling any metals. Containers storing indium parts should not be reused but disposed of according to local regulations.

Like all metals, any solid indium preform transformed to a fine powder (through processes like grinding or atomization) can cause some minor health issues if inhaled.

Indium metal is not currently restricted by any known legislation or pending legislation. This includes:

- RoHS: Not listed or restricted
- REACH SVHC: Not listed and no hazard identified
- USA DOT: No restrictions
- IATA: Non-hazardous
- UN: No restrictions
- NTP: Non-toxic
- OSHA: Non-toxic
- IARC: Non-toxic

Indium Corporation does not recommend, manufacture, market, or endorse any of its products for human consumption.

A full Safety Data Sheet (SDS) is available on our website at <http://www.indium.com/sds>

From One Engineer To Another®



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Shelf Life

Shelf life is the length of time a product can be kept in storage and still retain the original solder properties.

Since oxidation is one of the most important characteristics that can compromise the quality and strength of a solder joint, and because lead is the metal that oxidizes most readily, we consider the lead content of the preform in determining the shelf life of the product.

Shelf life is from 6 months to 2 years, depending on the product and the lead content.

Etching Indium to Remove Oxides

The formation of metal oxides on indium is self-passivating. A thickness of 80–100 angstroms of oxide is all that will form on the surface. Prior to using indium in a sealing or cold welding application, it is recommended that this oxide layer be removed.

Here is the recommended procedure for oxide removal:

1. Degrease the indium with an organic solvent, such as acetone, to remove any organic contaminants that may be on the surface.
2. Mildly etch the indium surfaces in a solution of 5–10% hydrochloric acid (by volume) at room temperature for 1–5 minutes, depending on oxide thickness, until the surface appears bright. This will remove the 80–100 angstroms of oxide that form on the surface.
3. Thoroughly rinse twice in DI water.
4. Rinse off the water with acetone (preferred) or isopropyl alcohol.
5. Blow-dry with dry nitrogen.

NOTE: Because this procedure slightly etches the metallic surface, exposing a larger surface area to oxidation, only the indium that is going to be used immediately should be cleaned by this procedure.

Return any unused, etched indium to storage under nitrogen or argon.

Reclaim

Reclaim may be available for indium products not fully consumed in your process. Generally, there are minimum return requirements and amounts below these minimums can be locally recycled.

Please contact your regional sales representative with further questions. Our team will explain all the steps in our recycling program—from shipping the material to Indium Corporation through assaying, quoting, processing, and settlement.

This application note 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.

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